

# Assessment of Back and Neck pain

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# Objectives

- ♦ Approach to spinal patients
- ♦ Diagnosis and Management of common spinal disorders
- ♦ Update on newer management techniques



# Low Back Ache

- ♦ 70-80% of the population experiences low back pain at some point in time
- ♦ Second commonest cause of missed work days (common cold is #1)

# Assessment

- ♦ History
- ♦ Physical exam
- ♦ Investigations





# Pain History

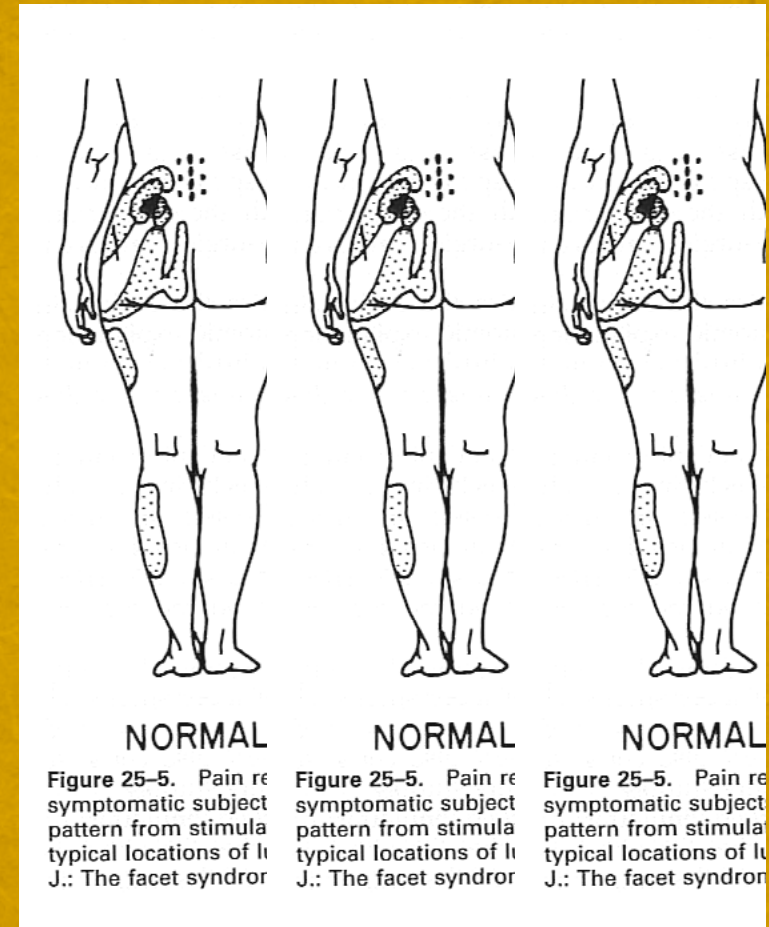
- ♦ **Onset / Duration of symptoms**
  - ♦ Acute (traumatic vs. non-traumatic)
  - ♦ Chronic
- ♦ **Nature**
  - ♦ Constant / Intermittent
  - ♦ Mechanical (only with activity)

# Location of Pain - Axial

- ♦ **BACK DOMINANT**
  - ♦ Worst pain is in the low back
  - ♦ radiates to buttock/ thigh not to the foot

## RADICULAR

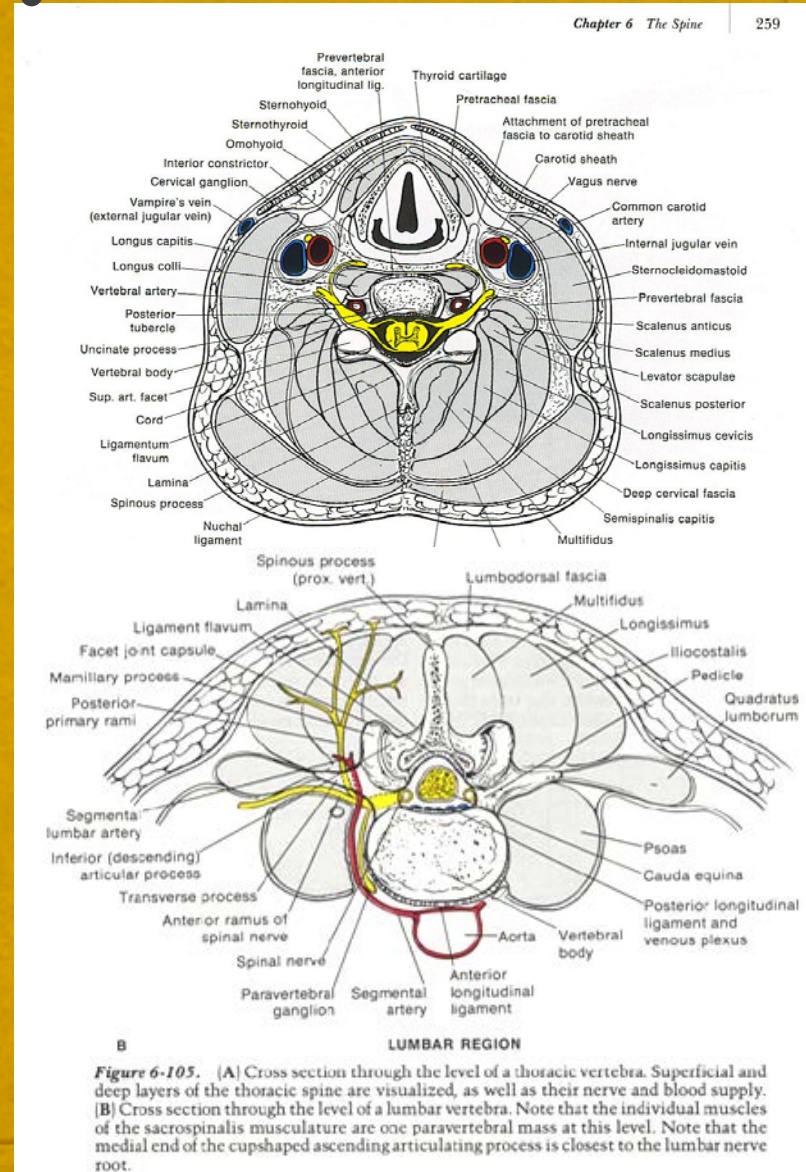
- Radiates to calf – L5
- Radiates to sole of foot – S1





# Why is Back Pain difficult to Treat?

- ◆ Back
  - ◆ Paraspinal Muscle / Fascia
    - ◆ Myofascial
  - ◆ Disc
  - ◆ Facet Joints
  - ◆ Nerve root (s)
  - ◆ Bone



# History

- ♦ **Red Flags = Emergency**

- ♦ Fever, Chills, Sweats
- ♦ Weight-loss
- ♦ Night Pain
- ♦ Cauda Equina Syndrome (LMN)
- ♦ Acute limb weakness (MRC grade -0,1,2 /5)



# Yellow Flags – non surgical candidates...

- ♦ Psychosocial factors shown to be indicative of long term chronicity and disability:
  - NEGATIVE ATTITUDE – BACK PAIN IS SEVERELY DISABLING
  - REDUCED ACTIVITY LEVELS – FEAR AVOIDANCE
  - DEPRESSION
  - SOCIAL OR FINANCIAL PROBLEMS

# Cauda Equina Syndrome

- ♦ Symptomatic Compression of the Cauda Equina
  - ♦ Bowel/Bladder/Erectile Dysfunction
  - ♦ Saddle Anaesthesia / Dysesthesia





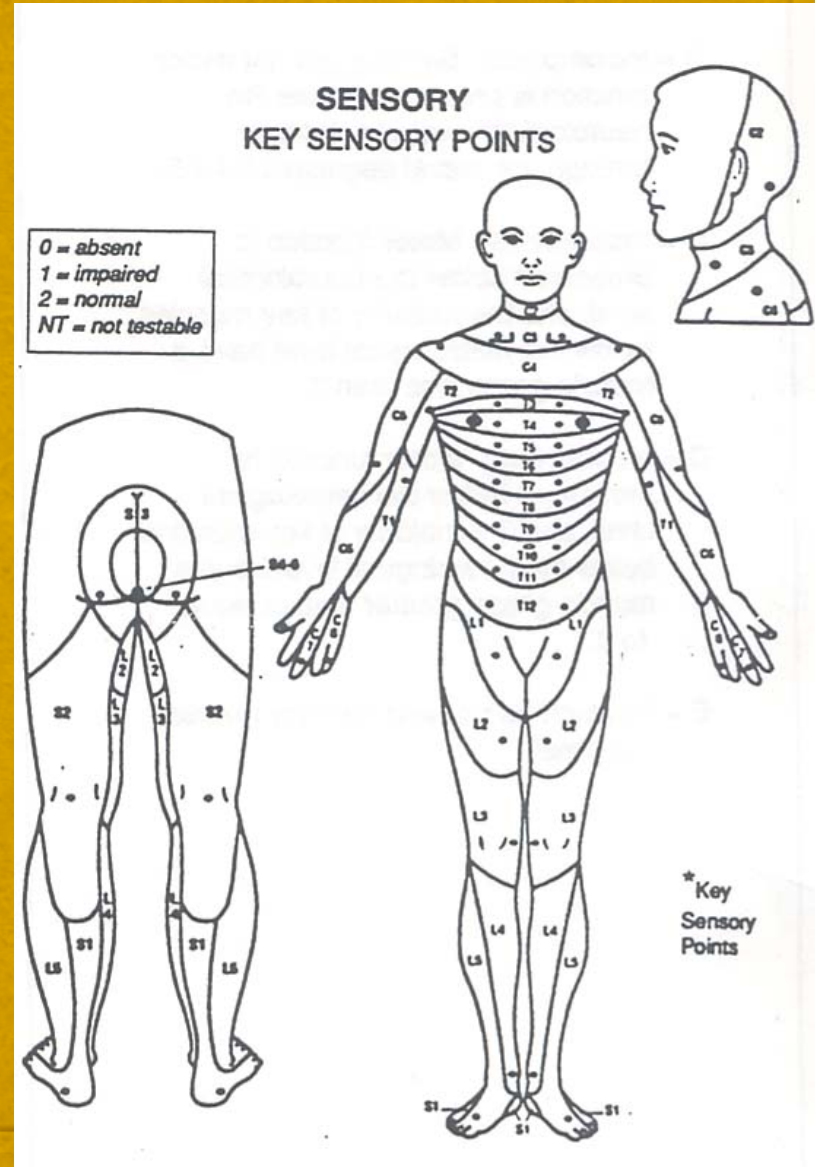
# Physical Exam

- ♦ Observation
  - ♦ Gait
  - ♦ ROM



# Physical Exam

- ♦ Neurological Exam
  - ♦ Sensory





# Neurological Exam - Sensory / Motor / Reflex

**Table 3** Neurologic levels of the extremities

Root	Reflex	Muscles	Sensation
<i>Upper Extremity</i>			
C5	Biceps reflex	Deltoid Biceps	Lateral arm (Axillary nerve)
C6	Brachioradialis reflex	Wrist extension Biceps	Lateral forearm (Musculocutaneous nerve)
C7	Triceps reflex	Wrist flexors Finger extension Triceps	Middle finger
C8	—	Finger flexion Hand intrinsics	Medial forearm (Medial antebrachial cutaneous nerve)
T1	—	Hand intrinsics	Medial arm (Medial brachial cutaneous nerve)
<i>Lower Extremity</i>			
L2	—	Iliopsoas +/- Quadriceps	Anterior thigh, groin
L3	Patellar reflex	Quadriceps	Anterior and lateral thigh
L4	Patellar reflex	Quadriceps; anterior tibialis (heel walking)	Medial leg and medial foot; medial malleolus
L5	+/- Posterior tibialis reflex	Extensor hallucis longus; hip abductors	Lateral leg and dorsum of foot; first web space
S1	Achilles reflex	Peroneus longus and brevis; gastrocsoleus (toe raising, walking)	Lateral foot; little toe

# **Simplified Motor examination**

- ♦ Walk on toes – **S1**
- ♦ Walk on Heels – **L5 and L4**
- ♦ Squat and get up – **L3 and L2**



# Physical Exam

- ♦ Rectal Exam
  - ♦ Pin prick sensation
  - ♦ Anal sphincter contraction

# Physical Exam

- ♦ **Deep Tendon Reflexes**
  - ♦ Beware of Hyper-reflexia!
  - ♦ Hoffmann's sign

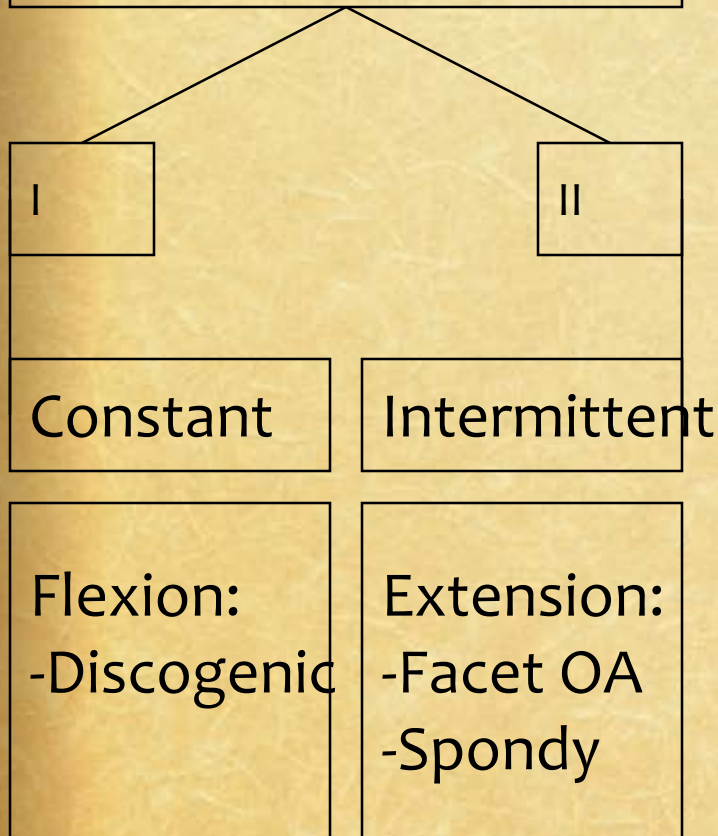


# Investigations

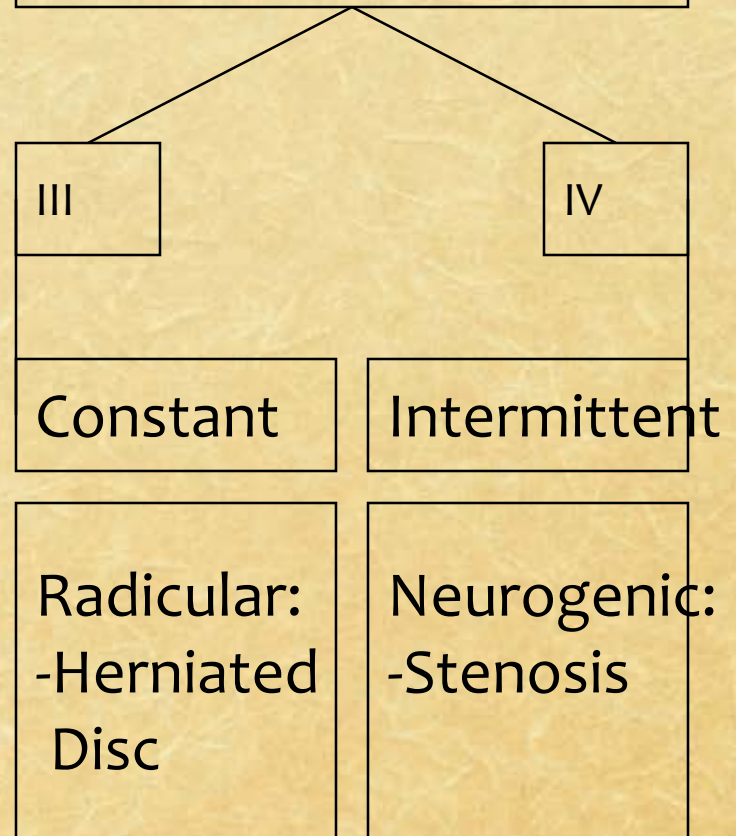
- ♦ MRI – Basic screening tool
- ♦ Blood inv – tumour or infection

# Lumbar - Pain Patterns

## Back Dominant



## Leg Dominant

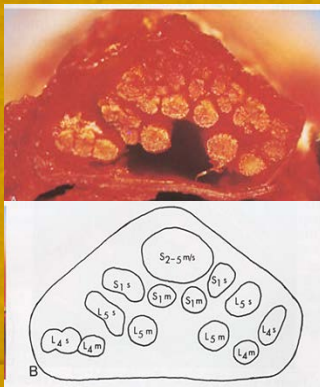


Individualized Treatment



# Good Surgical Outcome

- ♦ Leg
  - ♦ Nerve root compression
  - ♦ Often associated with neurological symptoms
    - ♦ Sensory / Motor



# Case 1

- ♦ 35 y.o. female, labourer, single mother
  - ♦ Atraumatic low back and progressive constant leg dominant pain times 3 weeks
  - ♦ Pain = left buttock, lateral thigh and dorsum of foot (?)
  - ♦ Associated with numbness, no weakness
  - ♦ No Red Flags (?)
  - ♦ Most likely diagnosis?



# Case 1

- ♦ Physical exam
  - ♦ Difficult heel walking on left (?)
  - ♦ Limited Lumbar ROM
  - ♦ Non-tender to palpation
  - ♦ Decreased sensation (PP) on dorsum of left foot (?), no weakness, normal reflexes, no upper motor neuron findings (?)

# Case 1

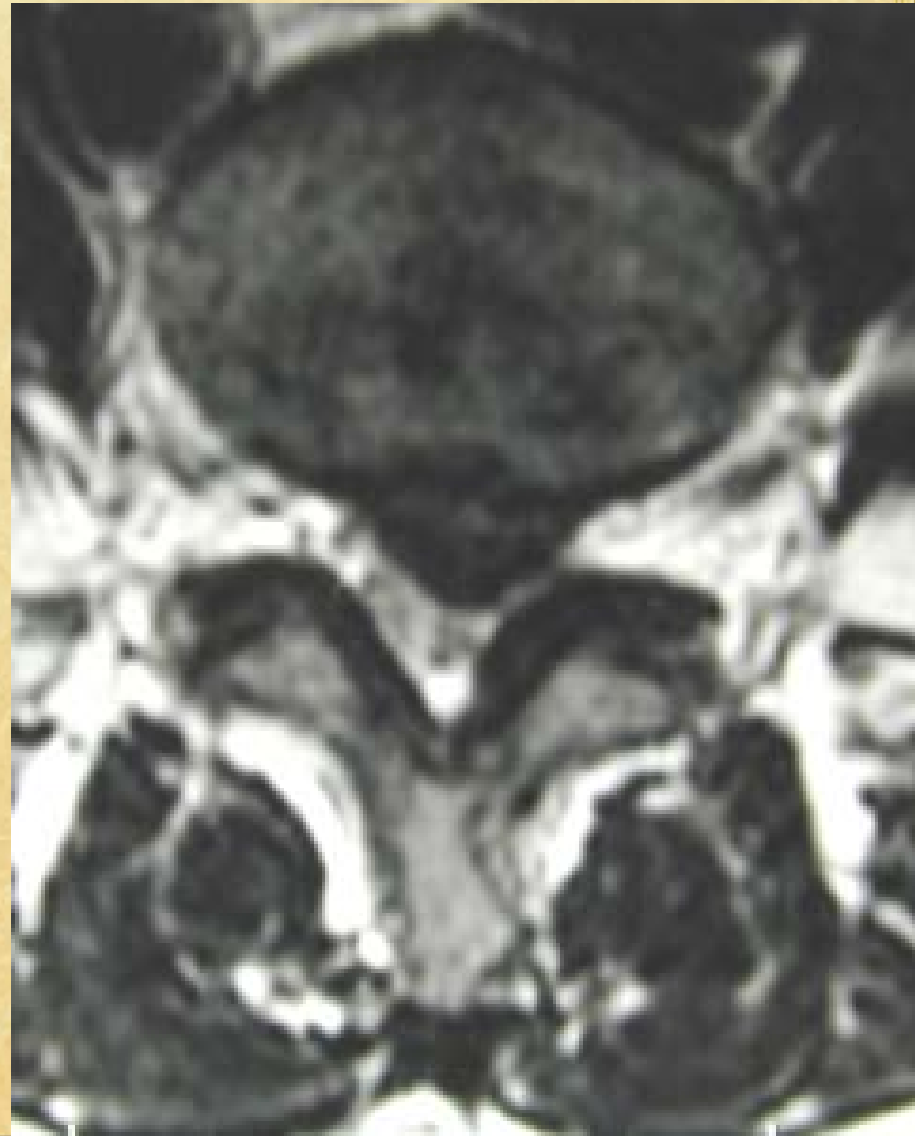
- ♦ Treatment Options - Which one(s)?
  - ♦ Drugs
  - ♦ Physiotherapy
  - ♦ Injections (e.g. selective nerve root block)
  - ♦ Alternative Medicine
  - ♦ Activity / Job Modification
  - ♦ Surgery
- ♦ Follow-up



# Case 1

- ♦ Comes back 6 weeks later, no better
  - ♦ In-fact she is worse
  - ♦ History (?)
- ♦ Investigations (?)

# Case 1- MRI





# Case 1

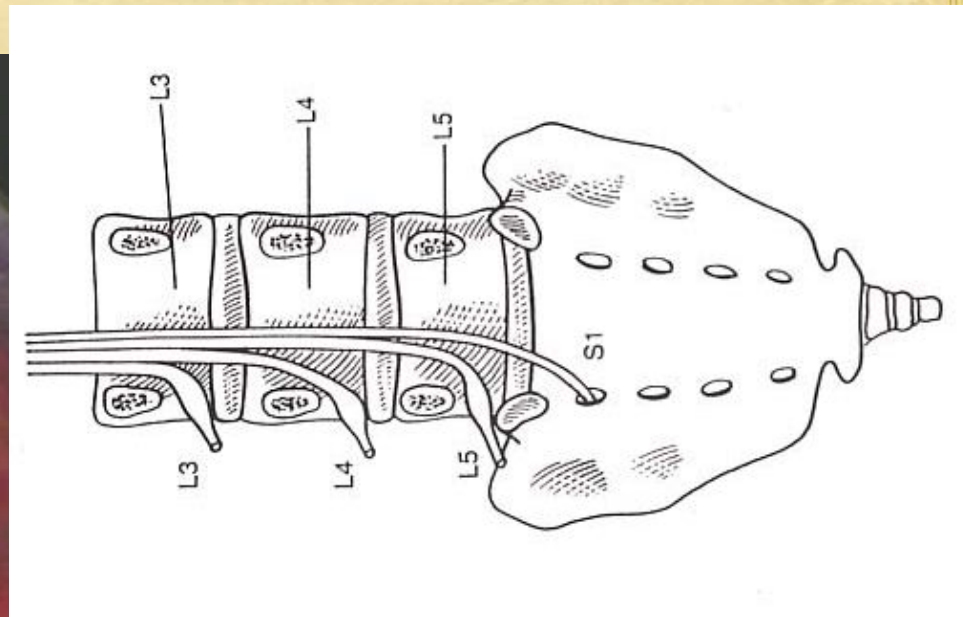
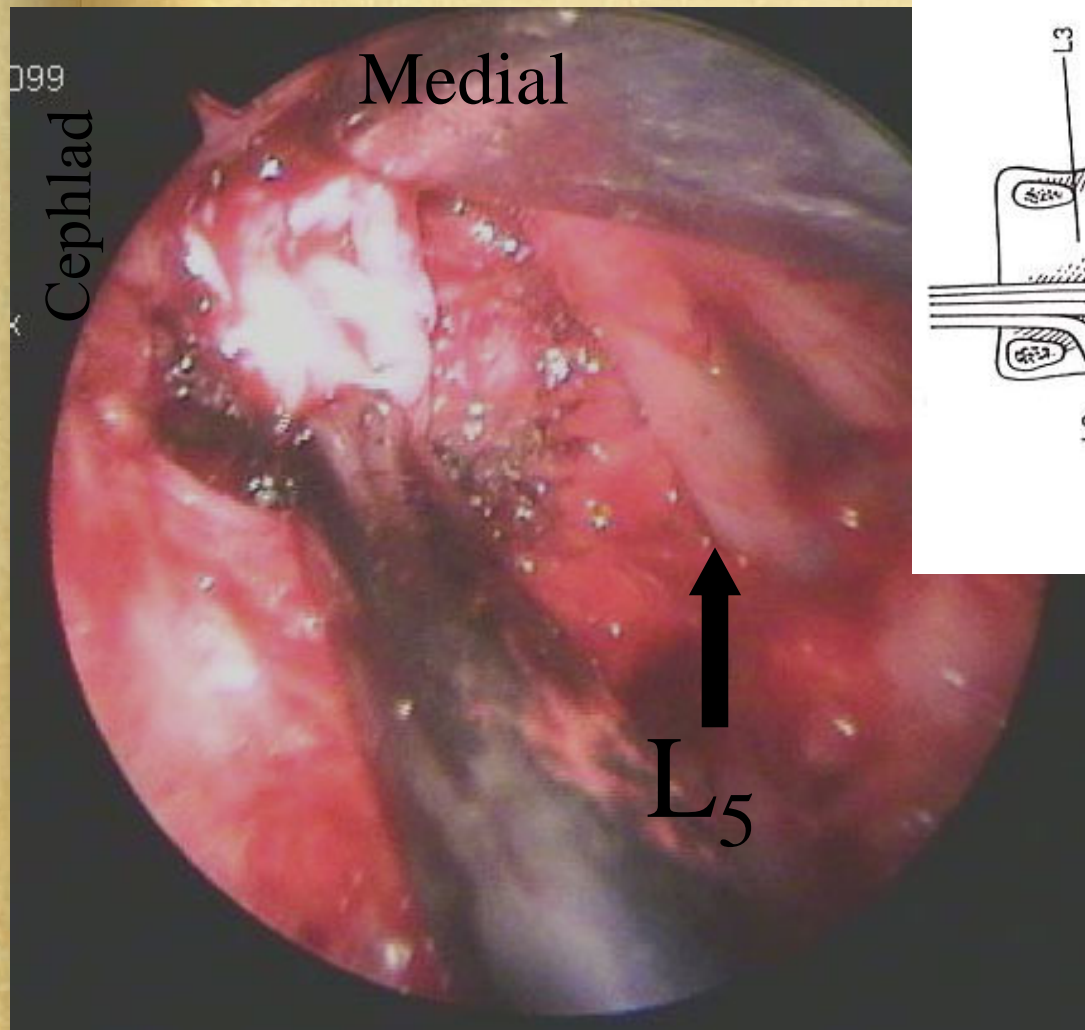
- ♦ Treatment Options (?)
  - ♦ Epidural or Nerve Root block
  - ♦ Surgery

# HNP - Surgical

- ♦ Elective Microdiscectomy
  - ♦ Typically done as day surgery
  - ♦ 80% success
  - ♦ Will not relieve back dominant pain
  - ♦ <1% significant complication rate
  - ♦ 5-10% recurrence rate of the same disc



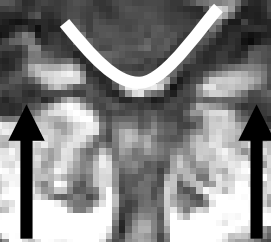
# HNP - Surgery



# Cauda Equina Syndrome

## Wide Decompression

-Minimize manipulation

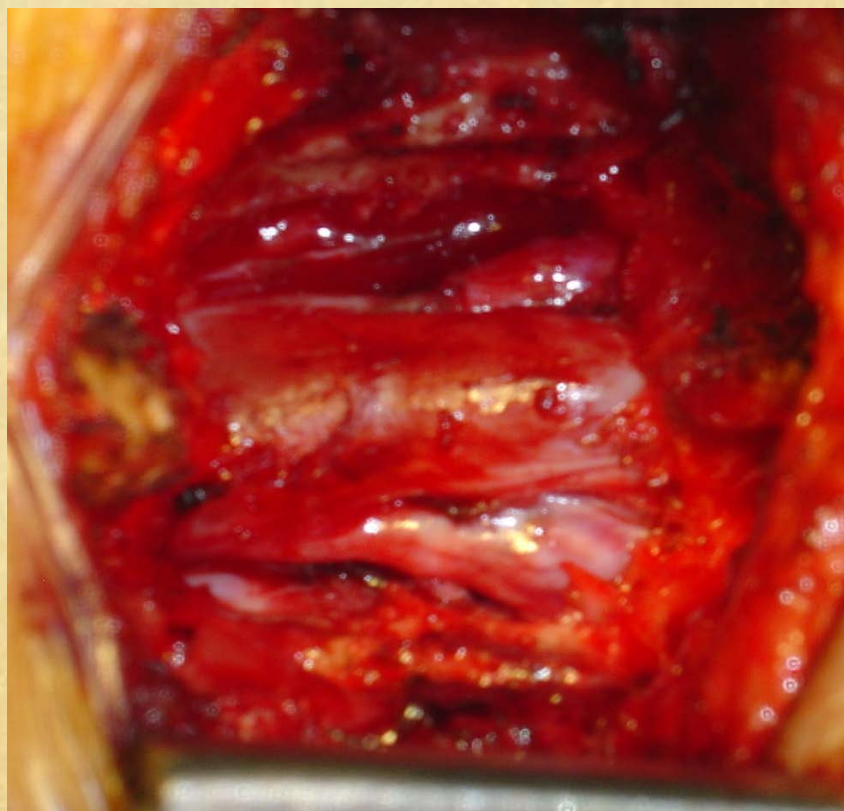
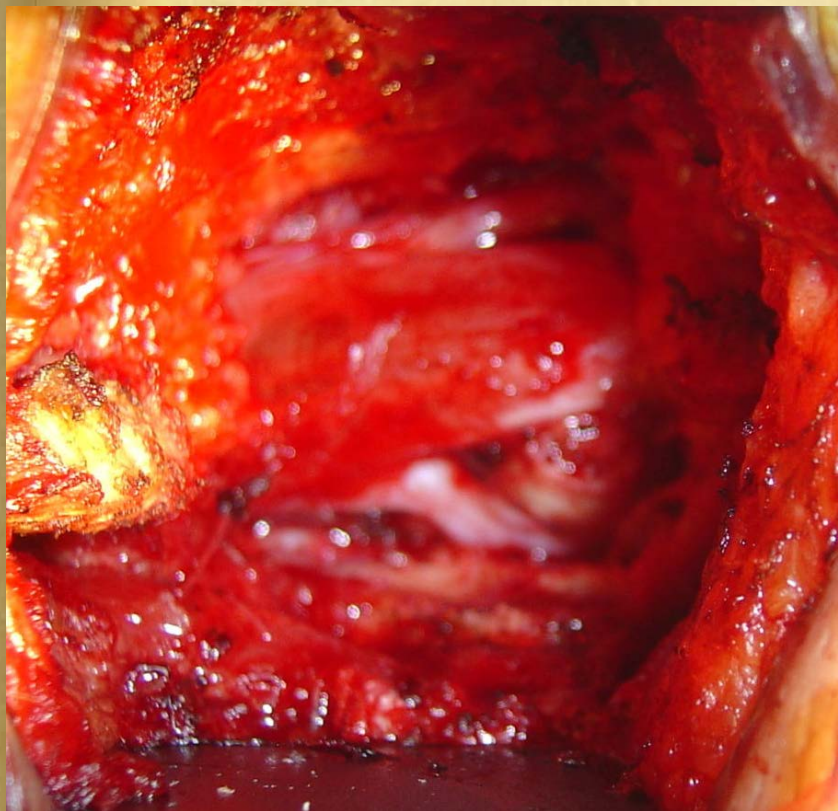


## Remove Disc Laterally

-may need to push back into disc space







# Case 2

- ♦ 65 y.o. male, retired
  - ♦ Atraumatic bilateral leg dominant pain times 6 months, no back pain
  - ♦ Pain = diffuse bilateral below the knee, associated with numbness, no weakness
  - ♦ Occurs with walking or standing
  - ♦ Relieved by sitting or lying down
  - ♦ No Red Flags (?)



# Case 2

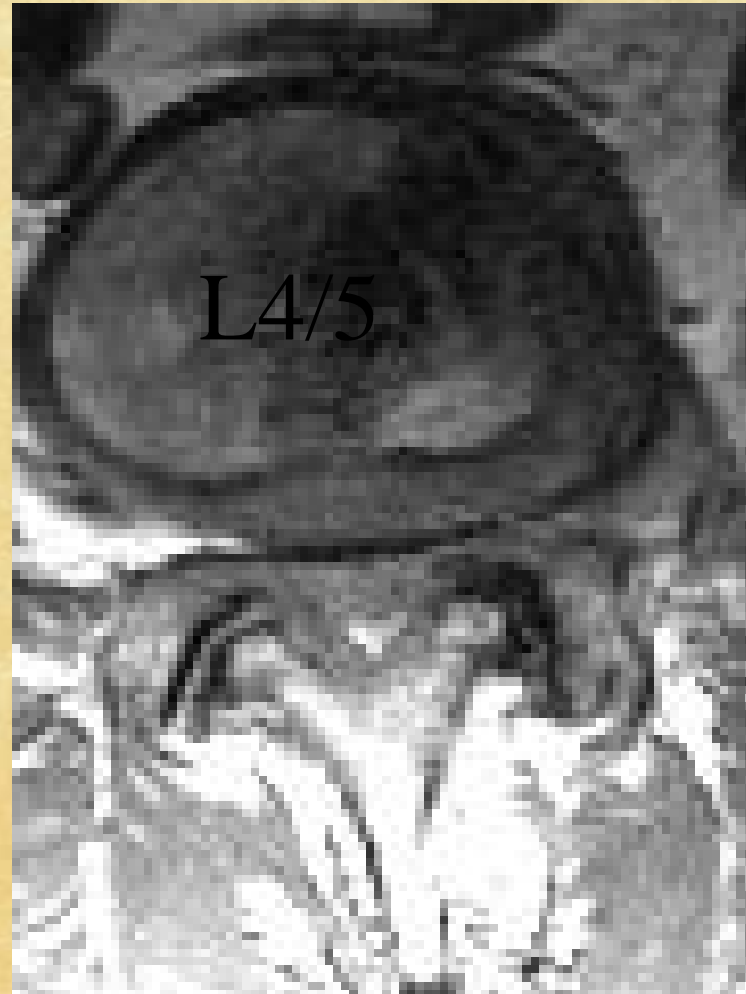
- ♦ Most likely diagnosis?
- ♦ DDx - Pulses
- ♦ Physical Exam
  - ♦ Normal

# Case 2

- ♦ Investigations (?)
  - ♦ MRI

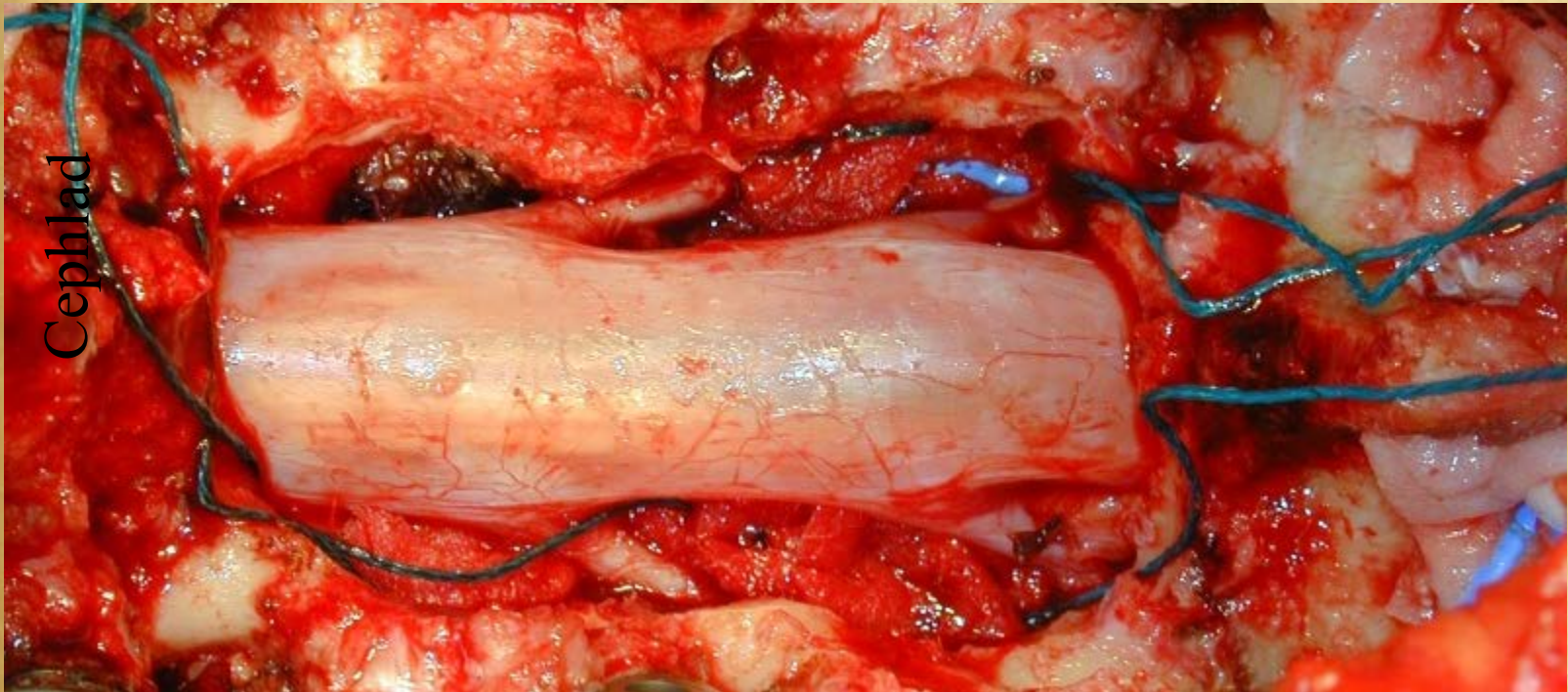


# Case 2- MRI



# Case 2 - Surgery

- ♦ Traditional Lumbar decompression

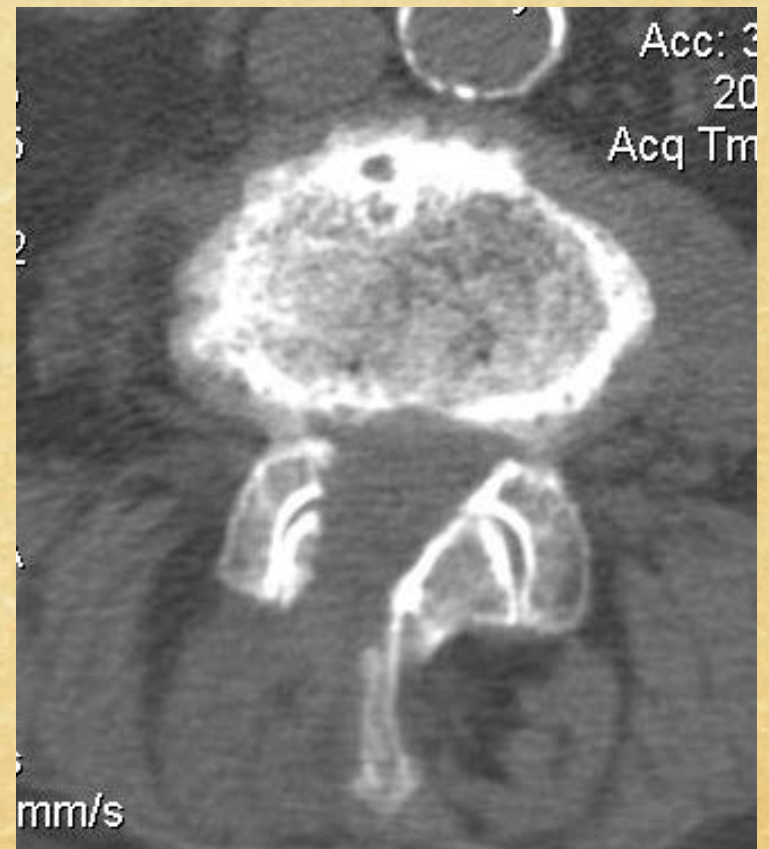
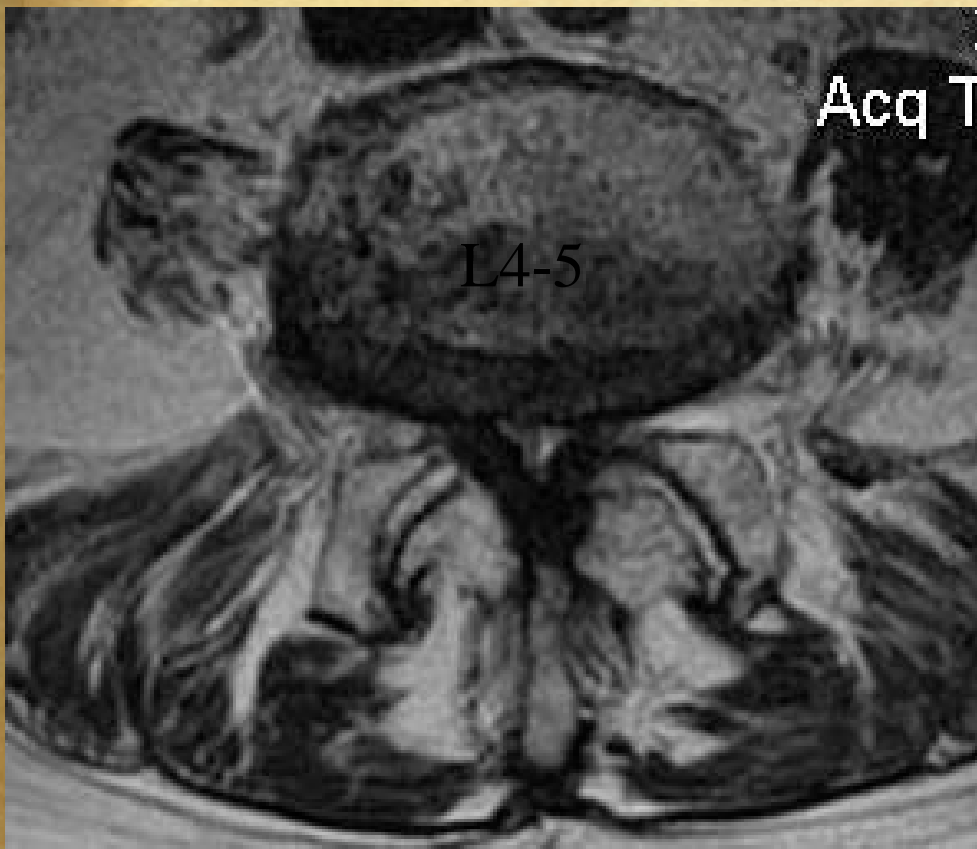






# Case 2 - Surgery

- ♦ Less invasive options

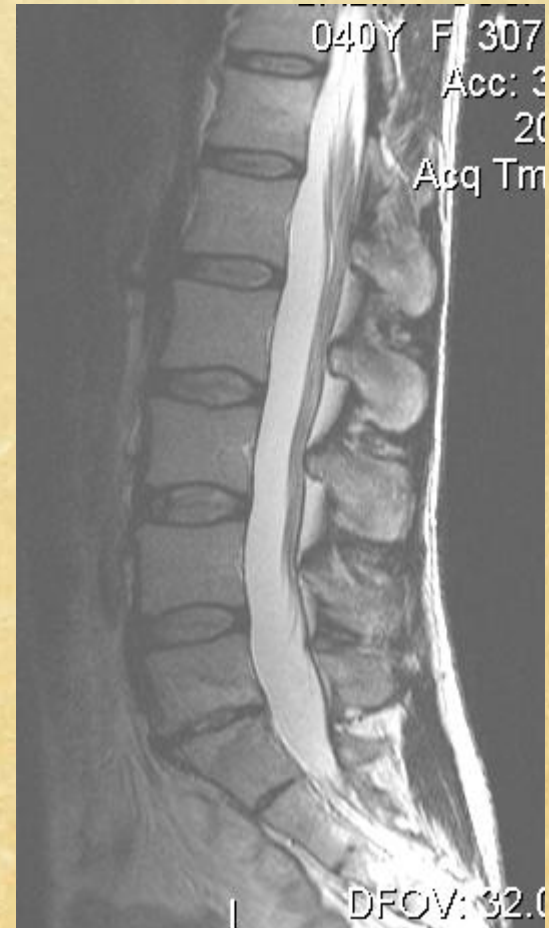
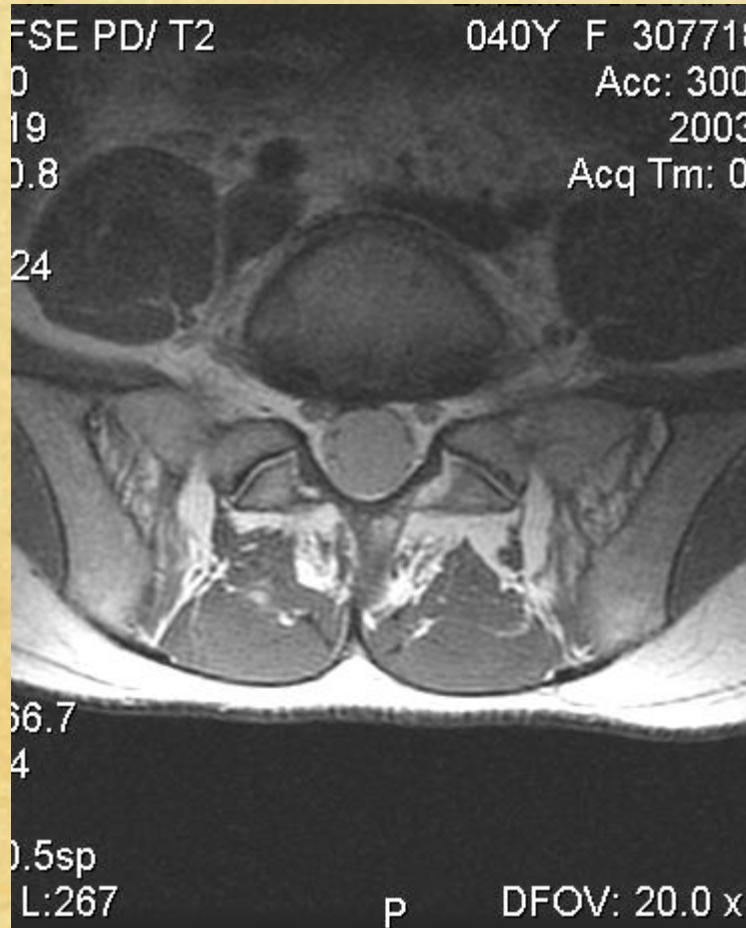




# Case 3

- ♦ 40 y.o. female, married, lawyer
  - ♦ Atraumatic, progressive low back pain for 5 years
  - ♦ Pain – localised
  - ♦ Aggravated by sitting (worse), walking, bending forward, lifting, sports
  - ♦ Alleviated by rest (lying down)
  - ♦ No Red Flags
  - ♦ Most likely diagnosis?

# Case 3 -MRI



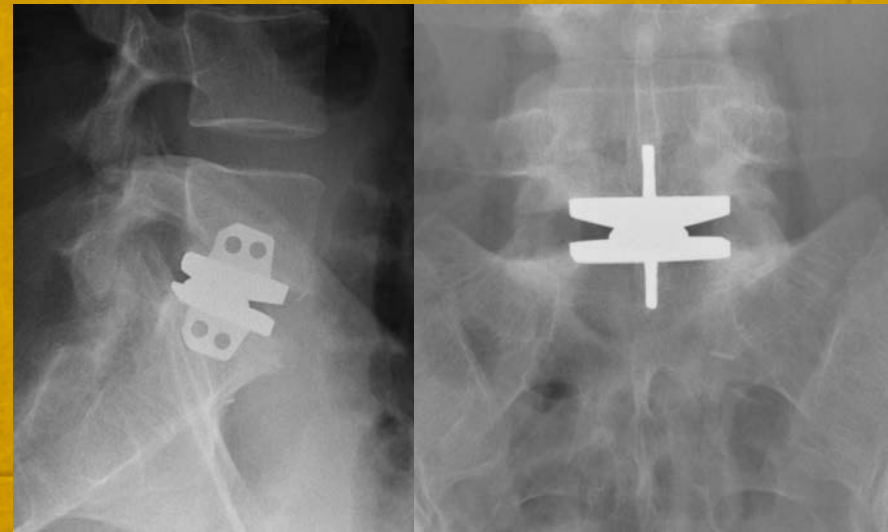
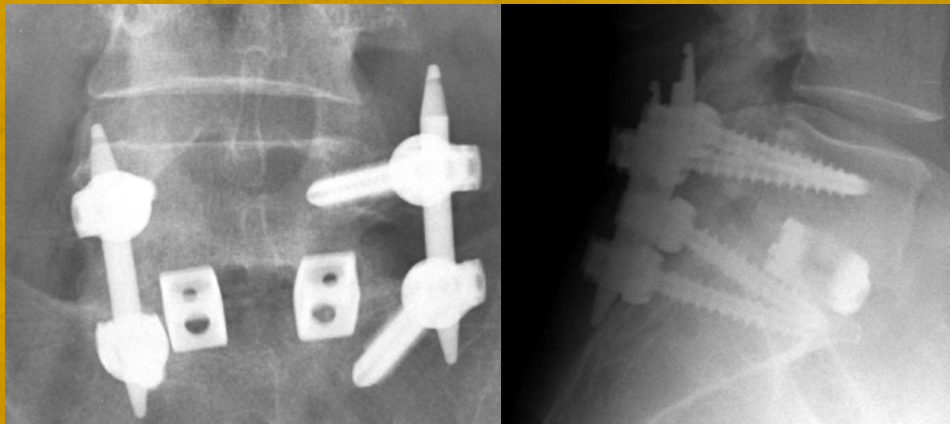
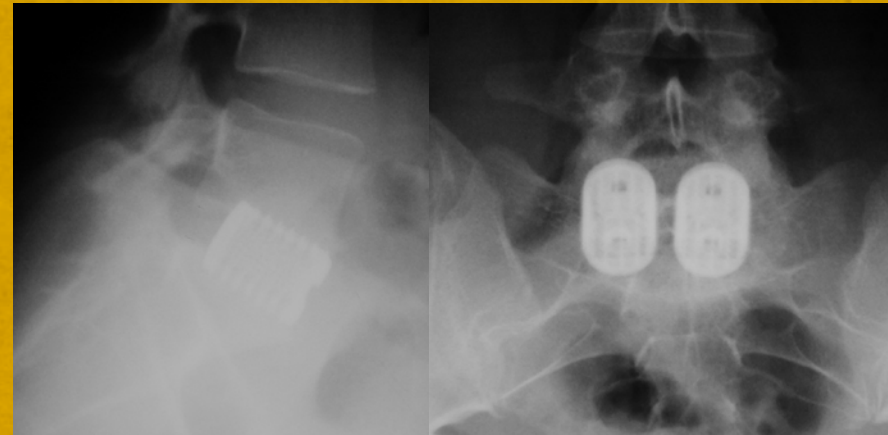


# Case 3

- ♦ Treatment Options - Which one(s)?

# Case 3

- ◆ No Improvement
- ◆ Surgical referral
  - ◆ Fusion
  - ◆ Disc Replacement





# Case 4

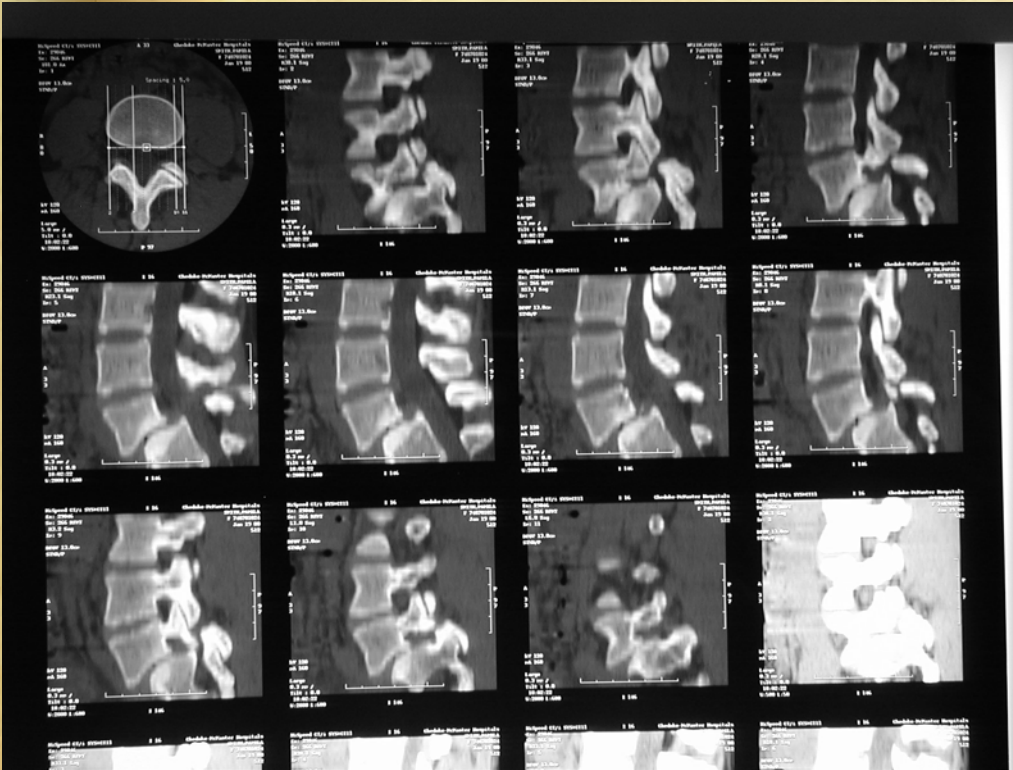
- ♦ 38 y.o. female
- ♦ Chronic mechanical back pain
- ♦ 6 month of progressive left leg radiculopathy (lateral calf and dorsum of foot) – intermittent
- ♦ Back = Leg symptoms
- ♦ Most likely diagnosis?

# Case 4

- ♦ Physical exam
  - ♦ Normal gait
  - ♦ Limited Lumbar ROM in extension
  - ♦ Non-tender to palpation
  - ♦ Normal Neurological exam
  - ♦ Special test (?)



# Case 4 – CT-MRI



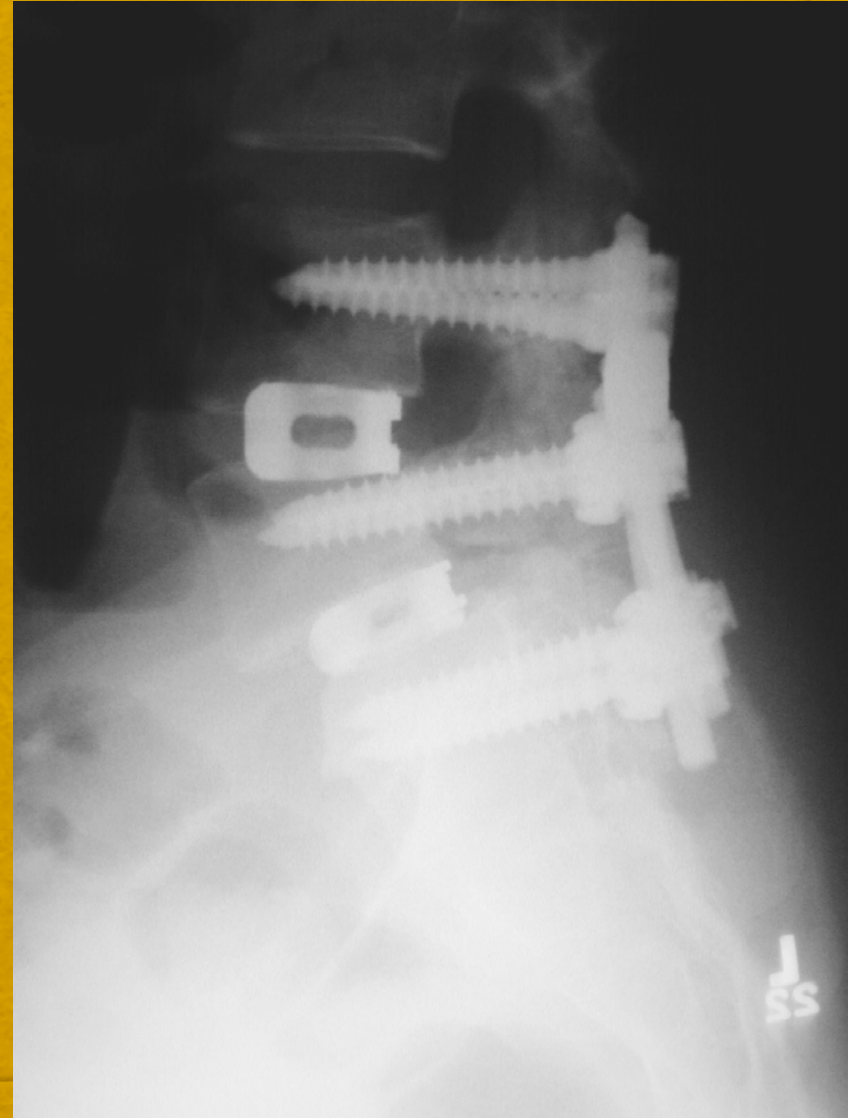
# Case 4

- ♦ Treatment Options - Which one(s)?

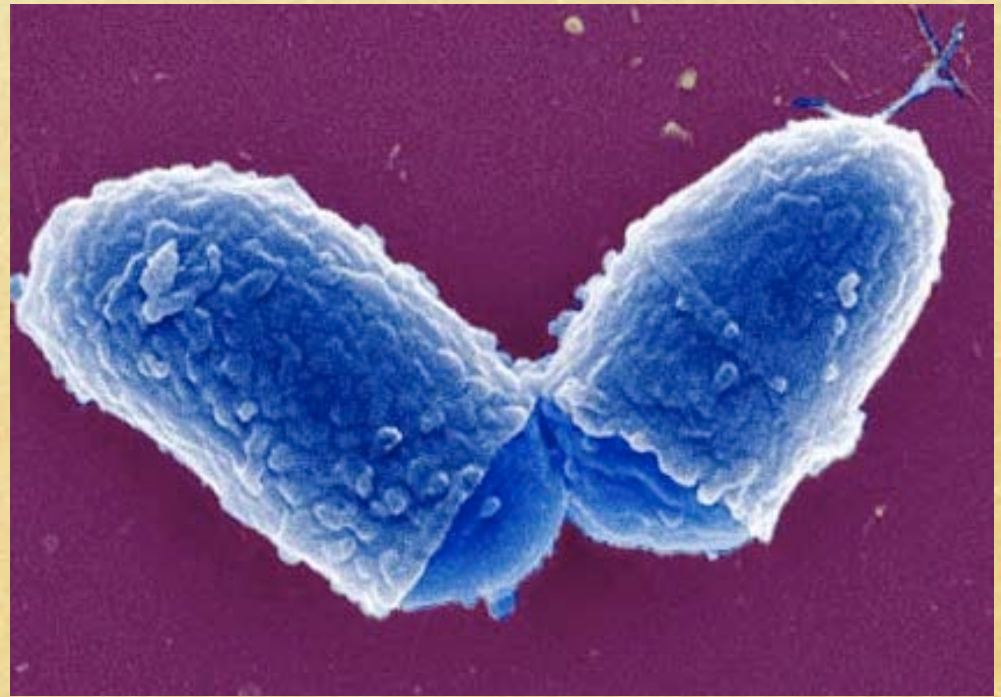


# Case 4

- ◆ No Improvement
- ◆ Surgical referral
  - ◆ Decompression and Fusion



# Antibiotics and Back Pain



Propionibacteria and Corynebacteria



# **MAST – Modic Antibiotic Spinal Therapy**



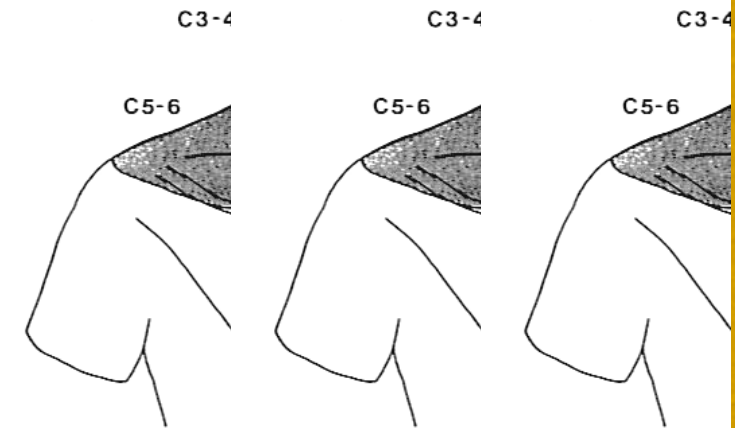
# NECK PAIN

- ♦ ~30-60% of population
- ♦ Typically self-limiting
- ♦ Not as frequent a cause for missed days at work vs. low back pain



# Location of Pain - Axial

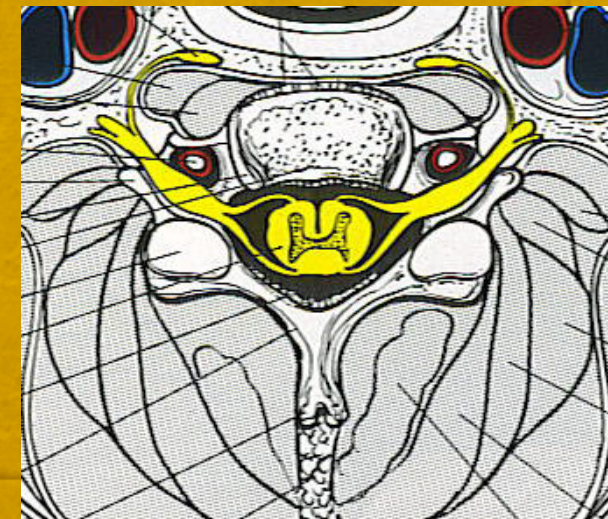
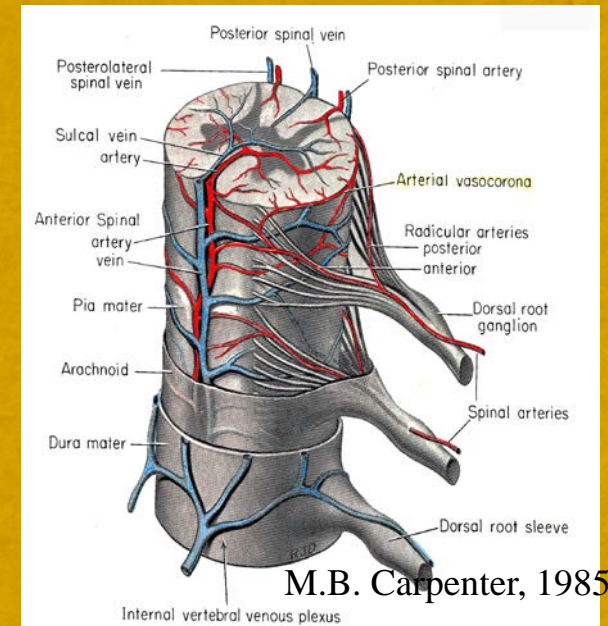
- ♦ Neck Dominant
  - ♦ Worse pain is in the neck
  - ♦ Frequently radiates to shoulders/interscapular



**FIG. 54-2.** A map of pain from cervical zygapophyseal joints in normal volunteers. (Reprinted with permission from N. Cervical zygapophyseal joints.)

# Source of Arm Pain

- ◆ Nerve root compression
- ◆ Middle finger – C7





# Myelopathy

- ♦ Symptomatic Compression of the spinal cord
- ♦ Difficulty in walking and Balance
- ♦ 'Falls at night' on going to toilet, sleep with light on
- ♦ Difficulty in doing buttons, handwriting change

# Case 1

- ♦ 45 y.o. female, office worker
  - ♦ Atraumatic neck and progressive constant arm dominant pain times 3 months
  - ♦ Pain = left shoulder, lateral arm down to elbow (?)
  - ♦ Associated with numbness and weakness of arm (?)
  - ♦ No Red Flags (?)
  - ♦ Most likely diagnosis?



# Case 1

- ♦ Physical exam
  - ♦ Limited neck ROM
  - ♦ Decreased sensation on lateral arm, weak shoulder abduction

# Case 2

- ♦ Investigations (?)
  - ♦ MRI



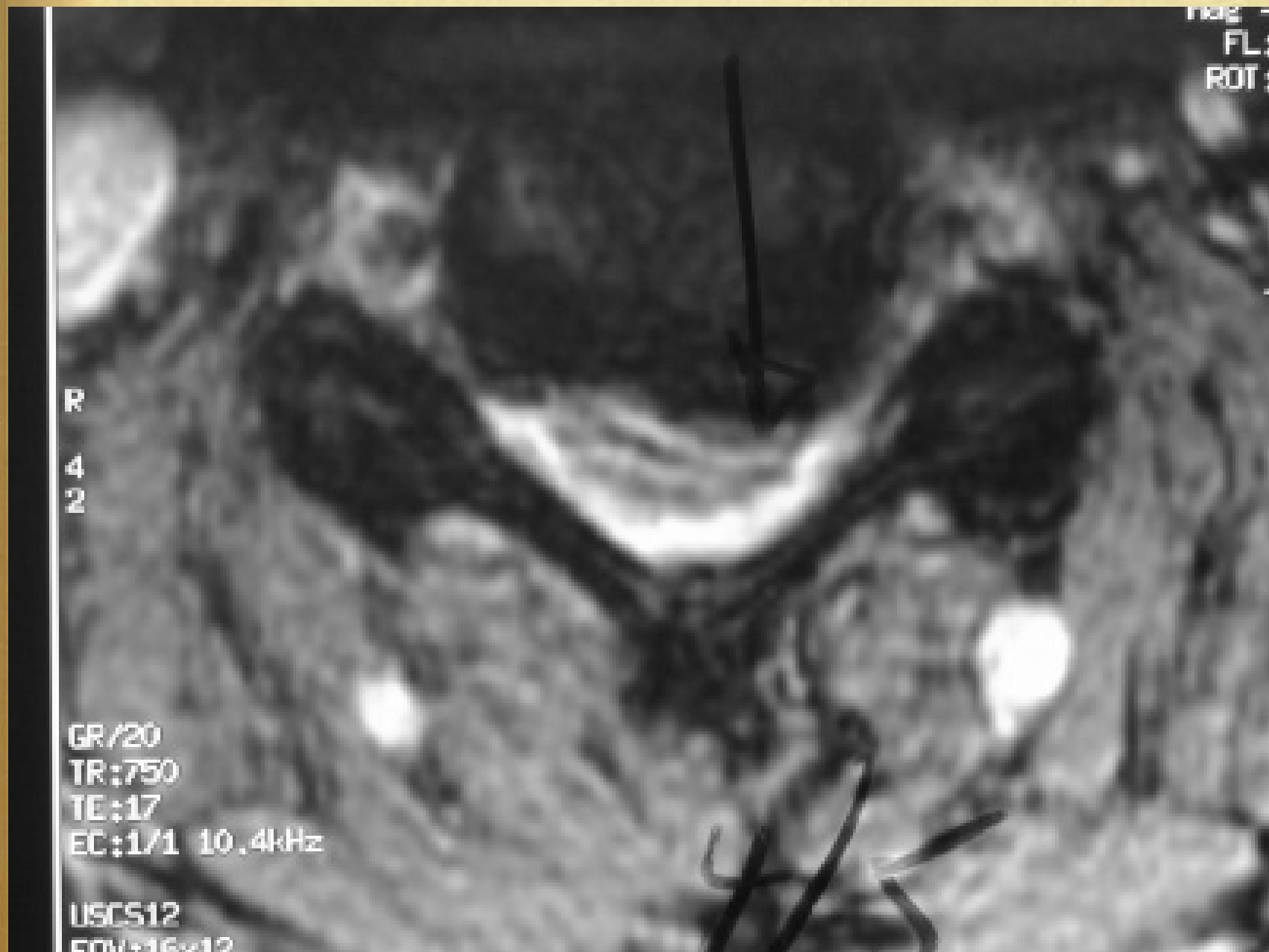


PAGE -  
FL:  
ROT:

R  
4  
2

GR/20  
TR:750  
TE:17  
EC:1/1 10.4kHz

USCS12  
EDM\*16x12





# Cervical Radiculopathy

- ♦ HNP doesn't always cause symptoms
- ♦ 80-90% will resolve with non-operative management
  - ♦ Reassure patient (i.e. pain will go away)
    - ♦ Can be horrible pain!
  - ♦ may recur at same level
- ♦ Refer to surgeon after 6-12 weeks

# Cervical Radiculopathy

- ♦ Elective Anterior Cervical Discectomy and Fusion (ACDF)
  - ♦ 80-90% success
  - ♦ Will not typically relieve neck dominant pain
  - ♦ <1% significant complication rate



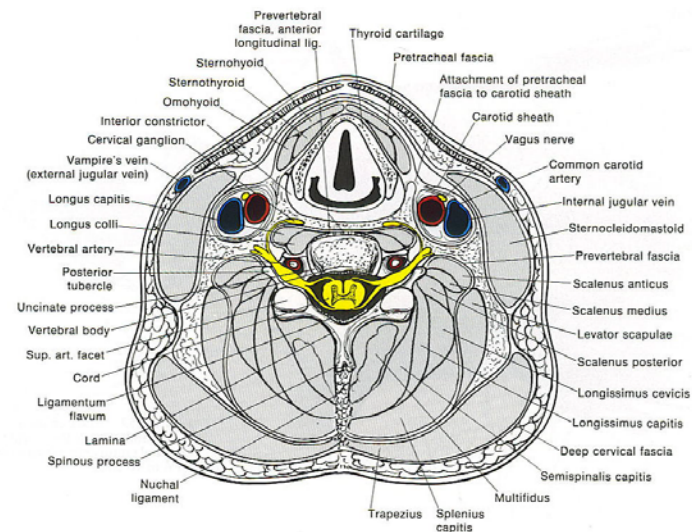
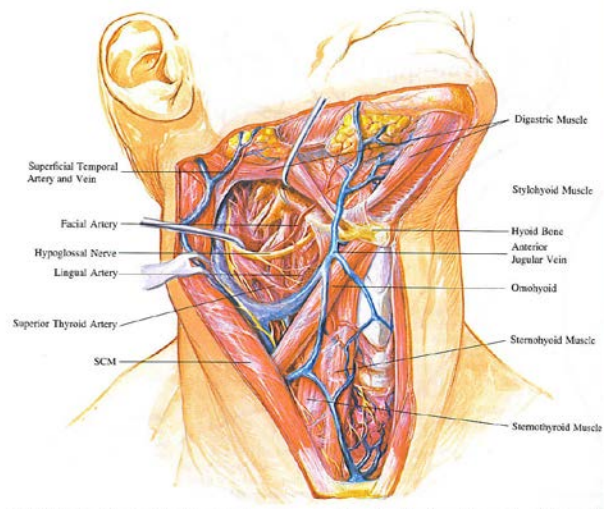
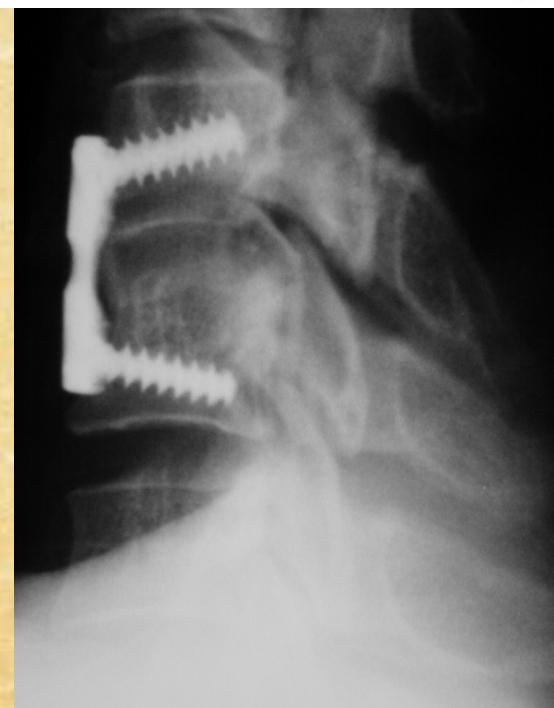
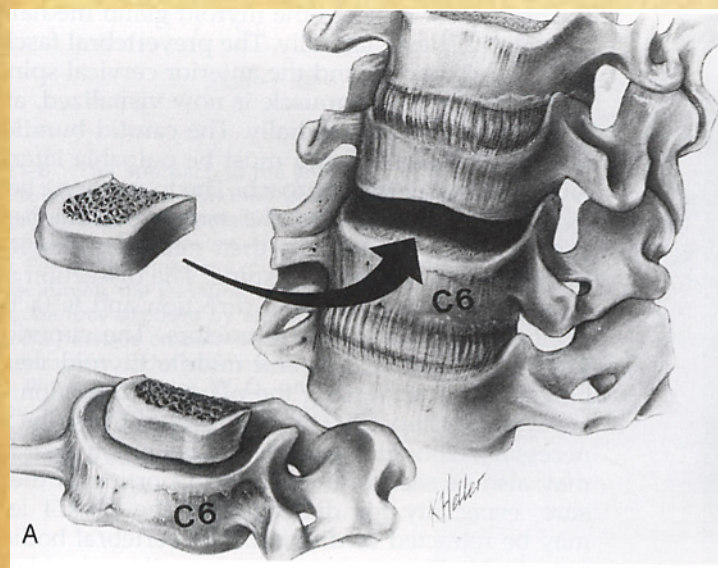


Figure 6-58. Cross section of the cervical spine. Note that the vertebral artery is anterior to the nerve root.



# Cervical Disc Replacement





# Case 2

- ♦ 72 y.o. male, retired
  - ♦ 6 months atraumatic onset neck pain
  - ♦ 3 months progressive difficulties with using hands, numbness both hands
  - ♦ Gait is unbalanced

# Case 2

- ♦ Most likely diagnosis?
- ♦ Physical Exam
- ♦ Cant tandem walk
- ♦ Romberg's test positive
- ♦ Hyperreflexia
- ♦ Spastic
- ♦ Positive Hoffmann's sign
- ♦ Next Steps ???



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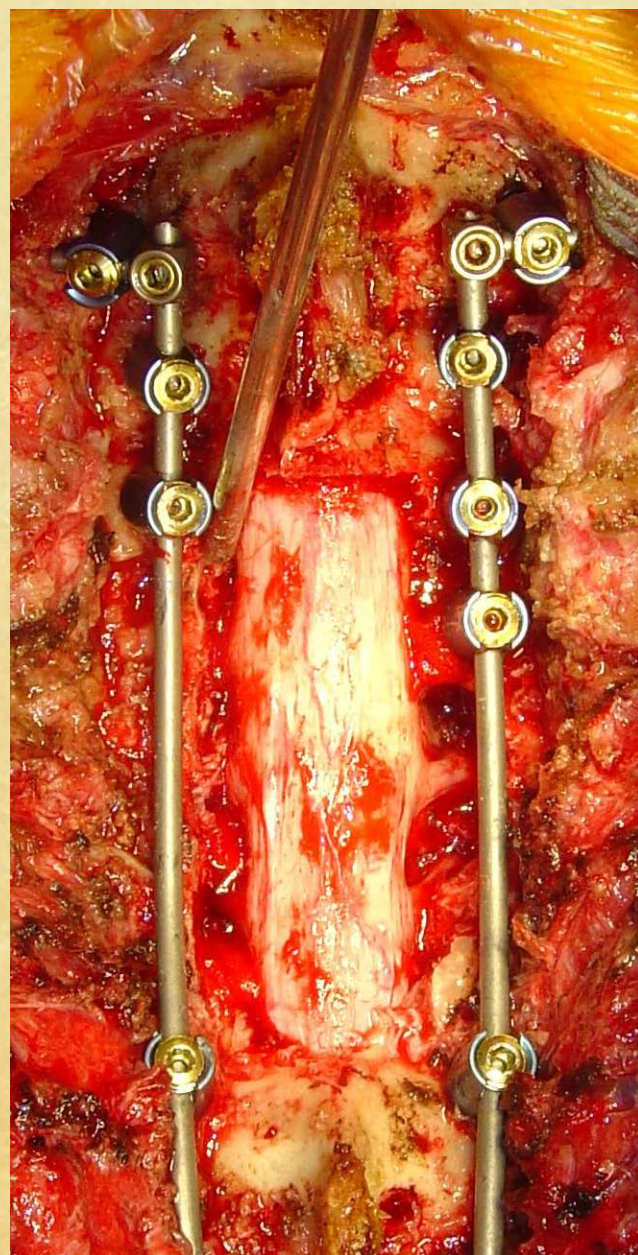
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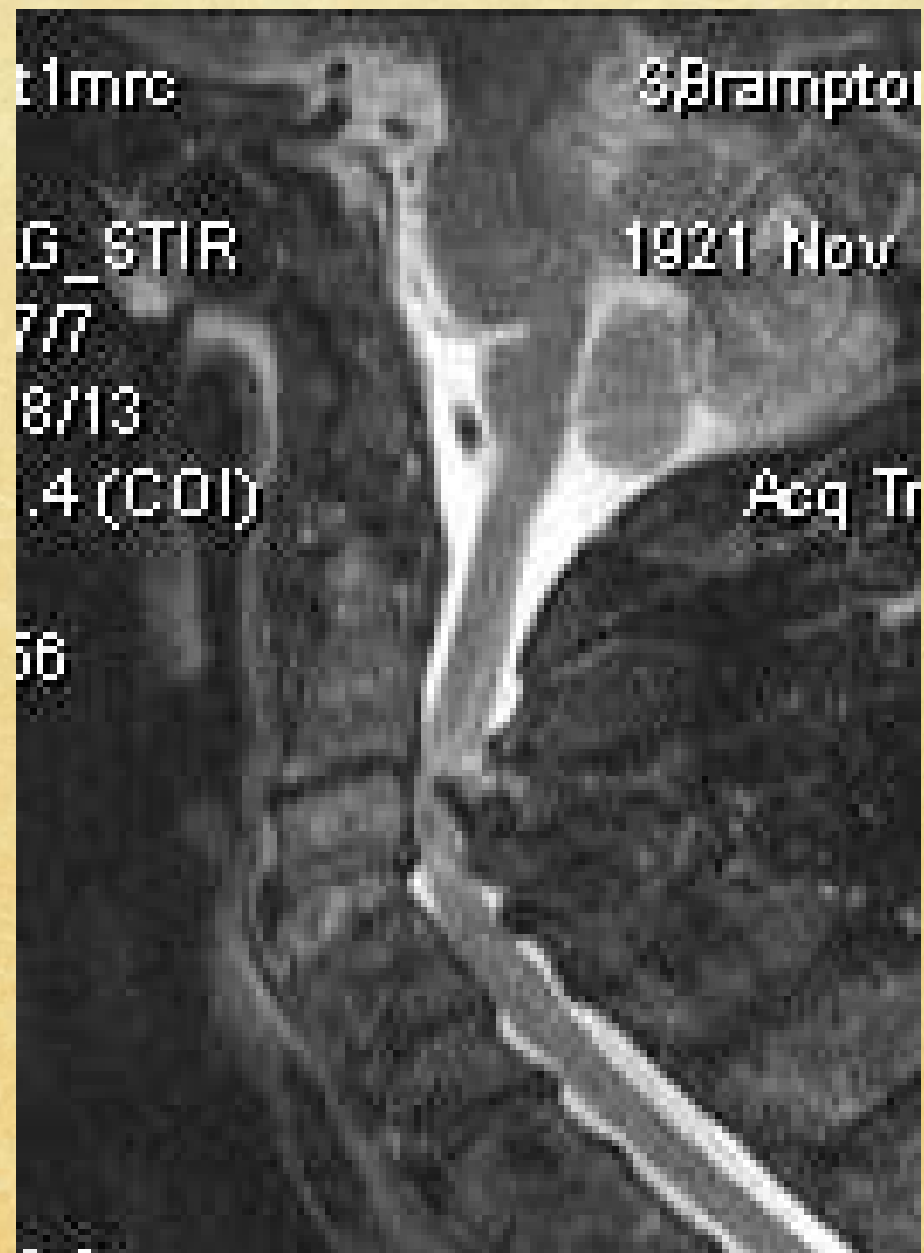


# **Surgery – Urgent with in 4 weeks**

- ♦ Posterior Decompression and Fusion









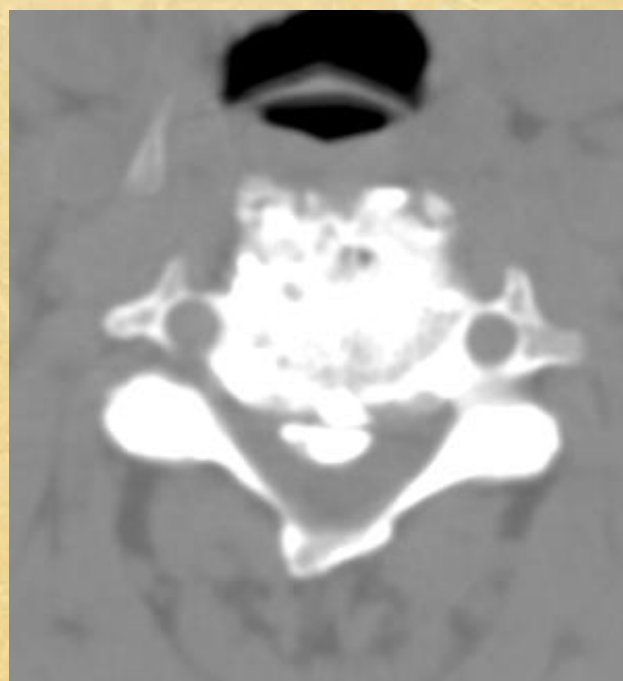




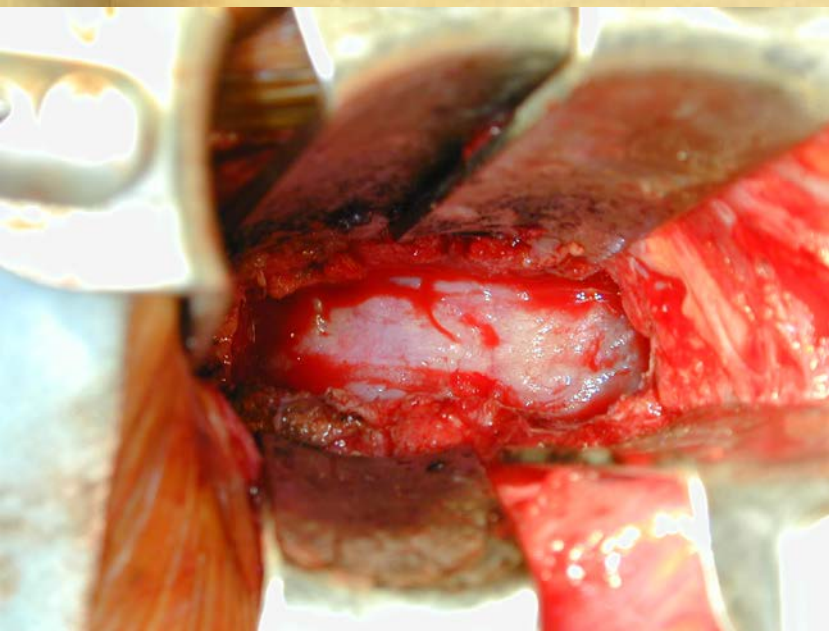


# Case 3

Similar history and  
examination





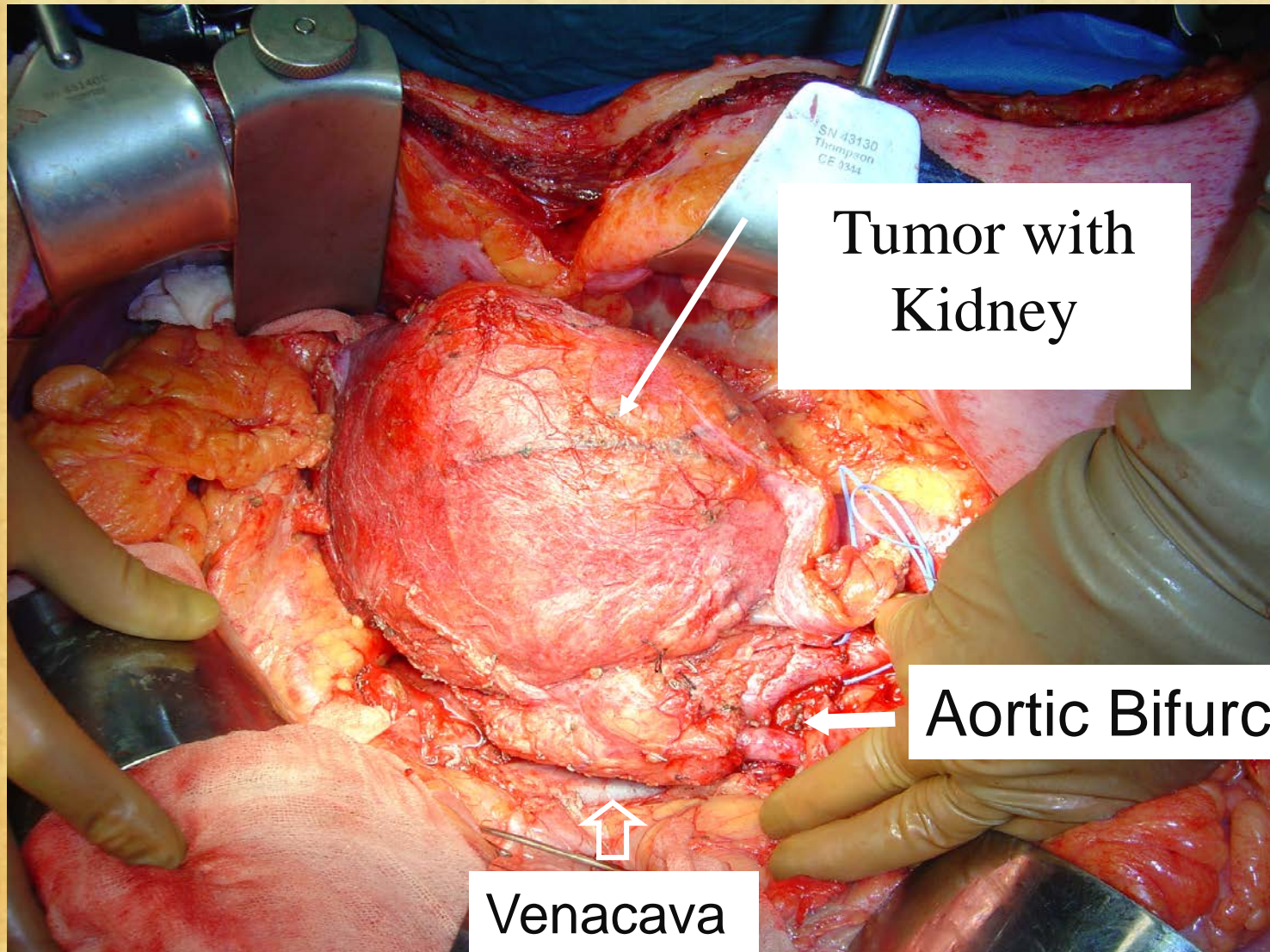


Not always so straightforward .....



Patient with abdominal pain and  
weakness in both legs

# Stage 2 - Anterior



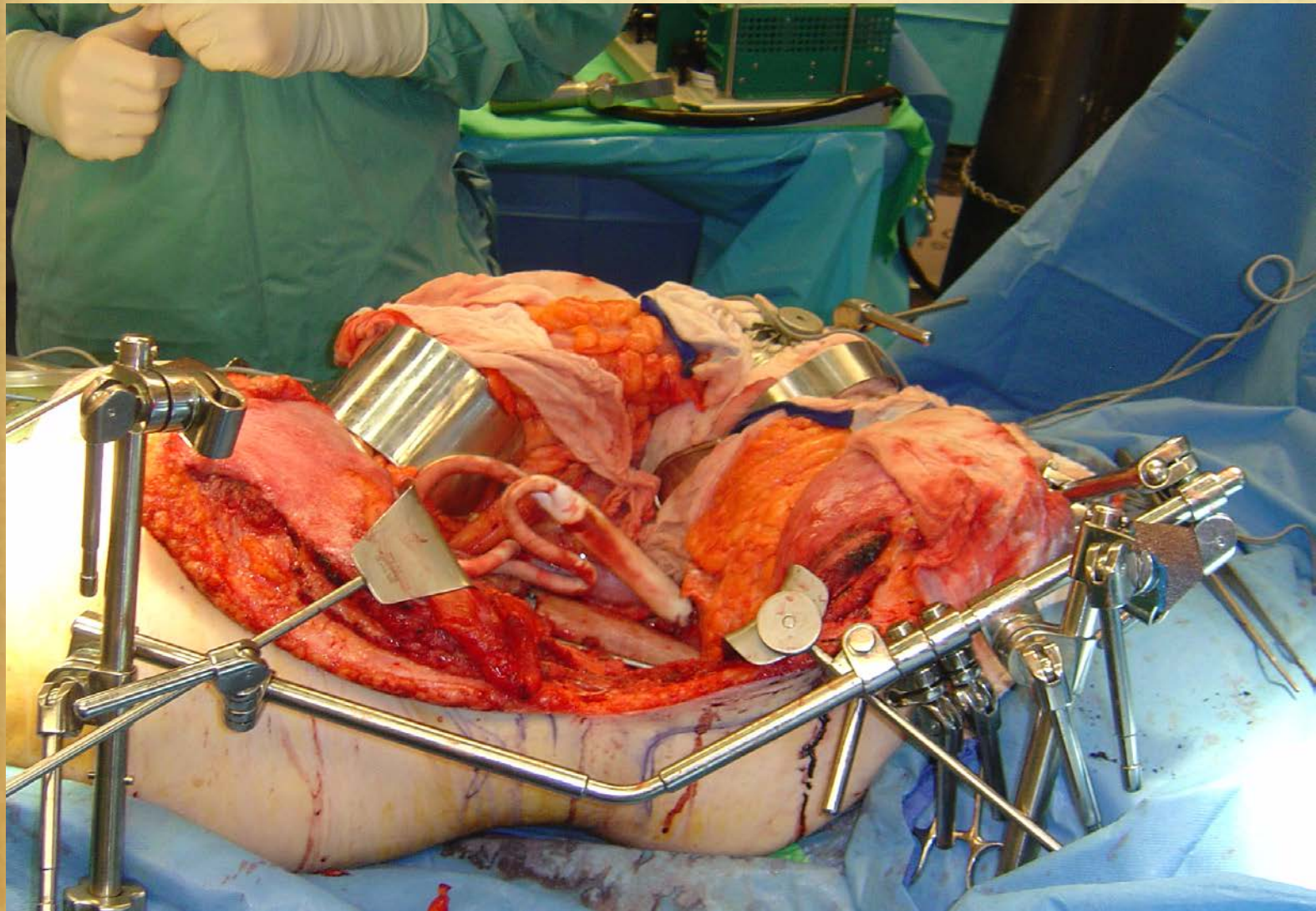




L2 with step cut of L1 and L3

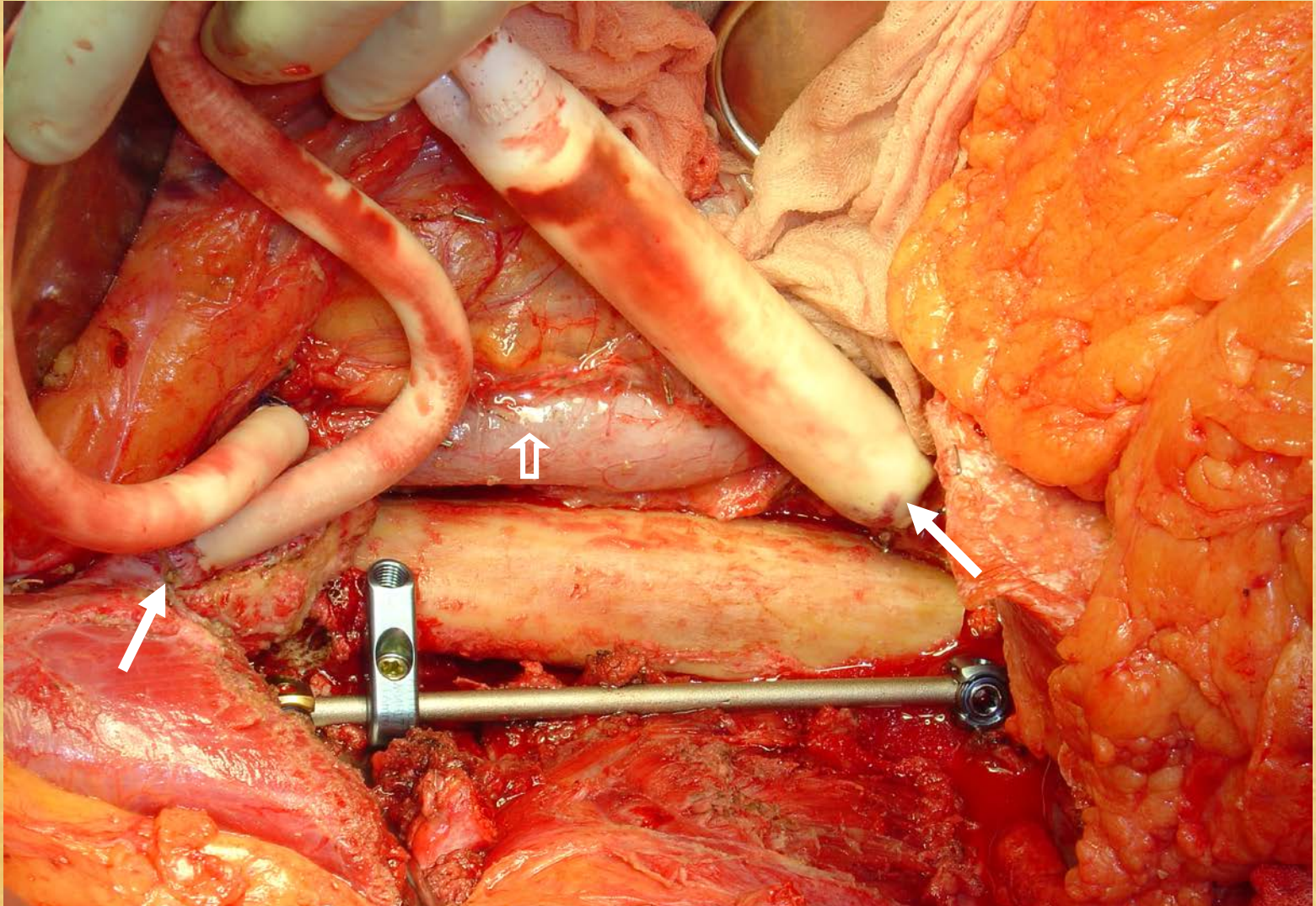


# T-Incision Laparotomy



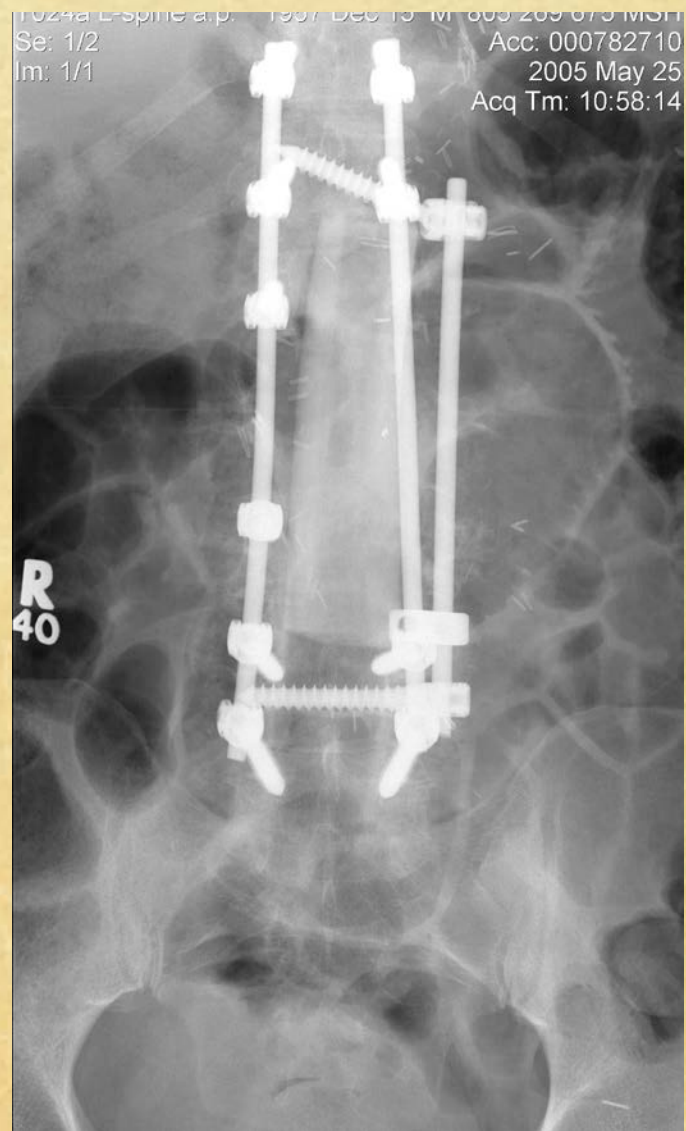
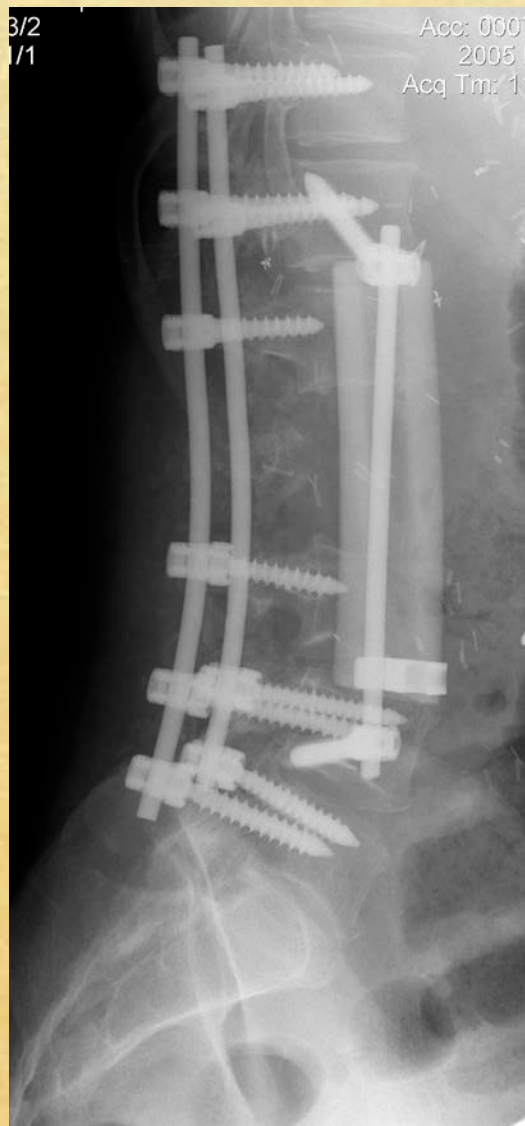


# Long Iliac limbs to allow spine reconstruction.



Segmental shortening of Iliac limbs at completion with end-to-end anastomosis.







Patient with dysphagia and arm pain

# C1-3 Chordoma

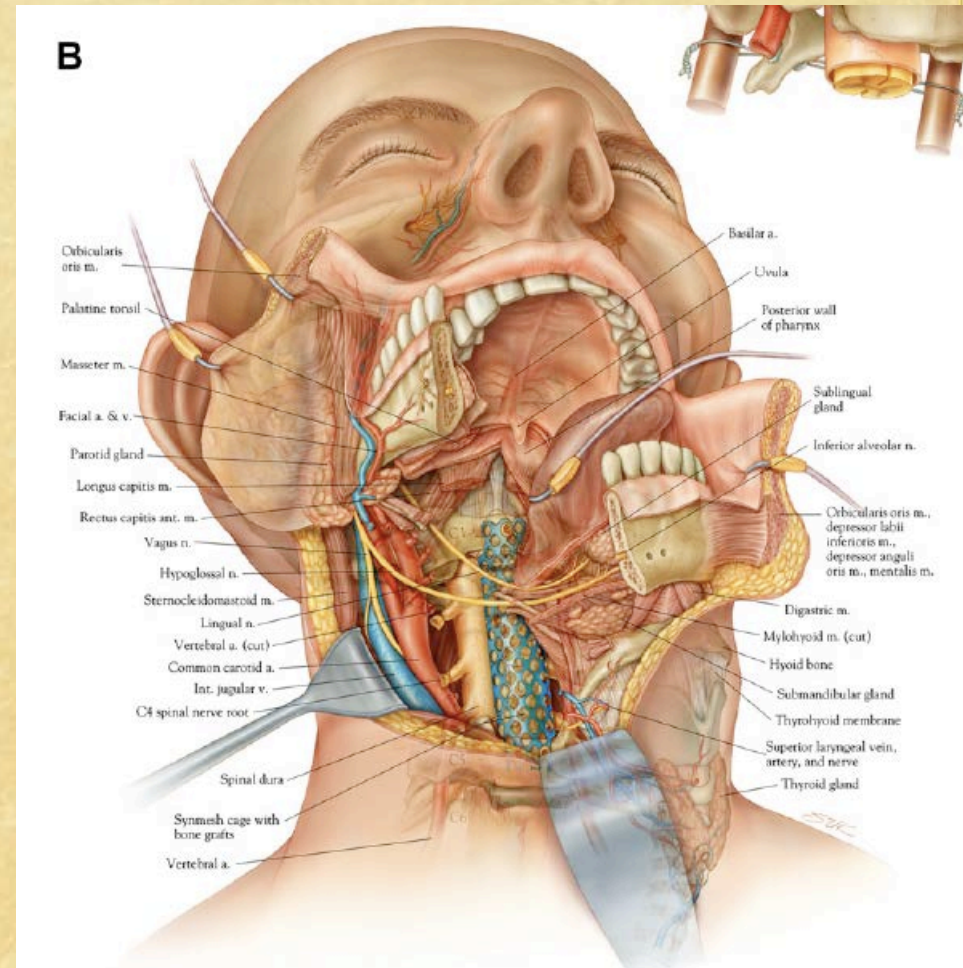
- 59 year old patient
- Neck pain / Dysphagia
- Bilateral vertebral artery involvement at C2





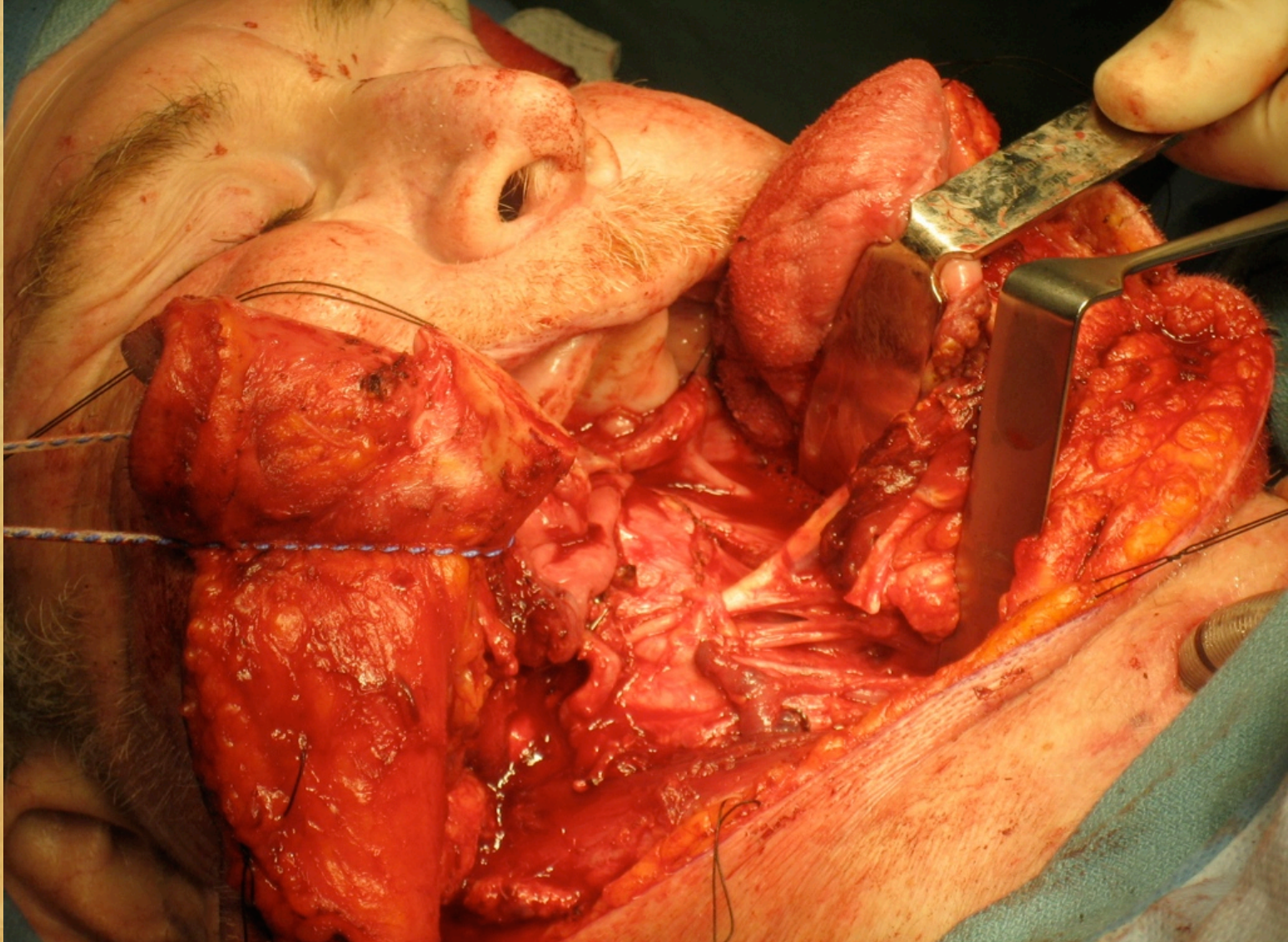
# Surgical Approach

- Staged Front and back
- Challenging reconstruction
- Vascularized fibular graft
- Complex soft tissue recons.

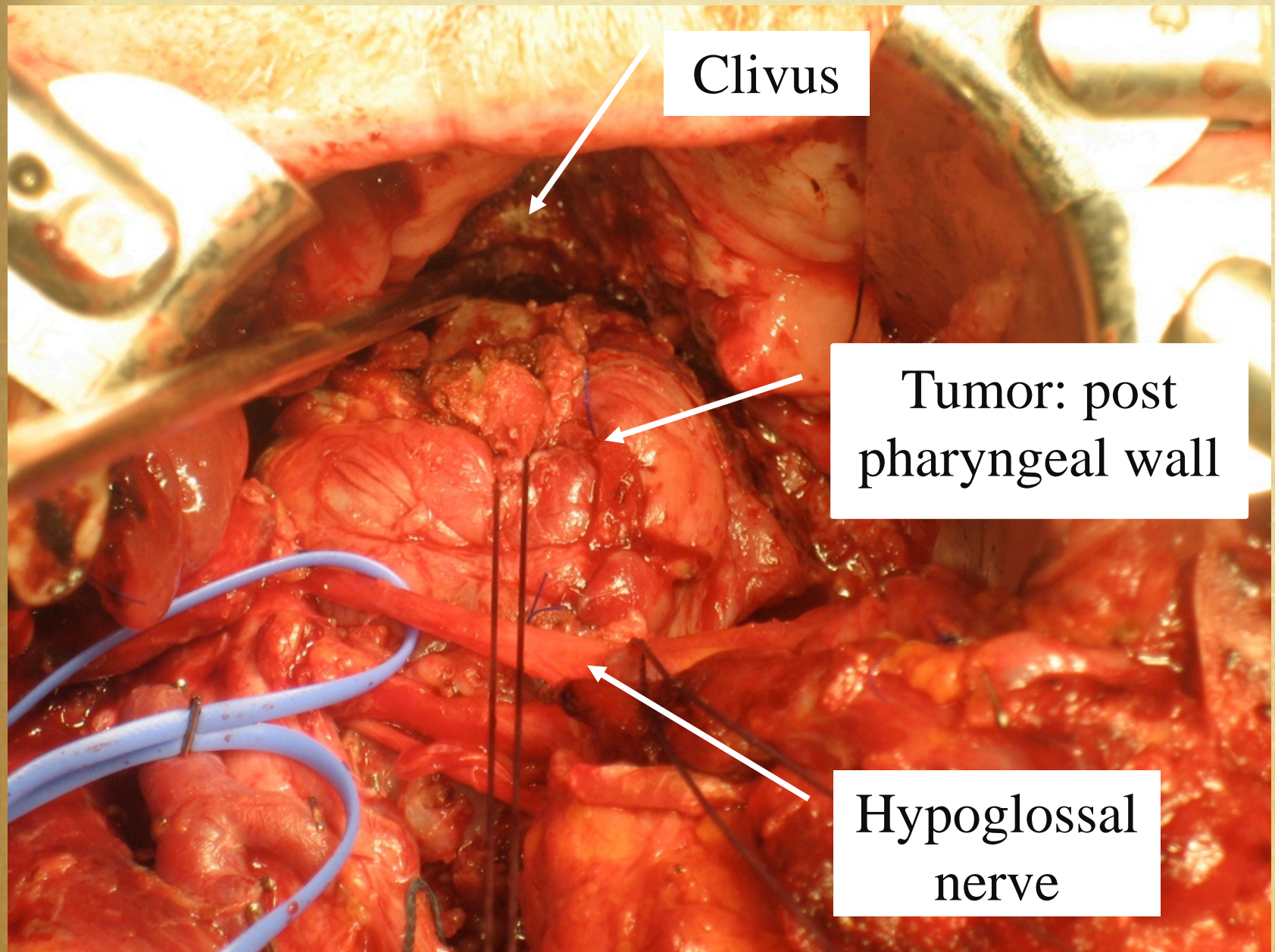




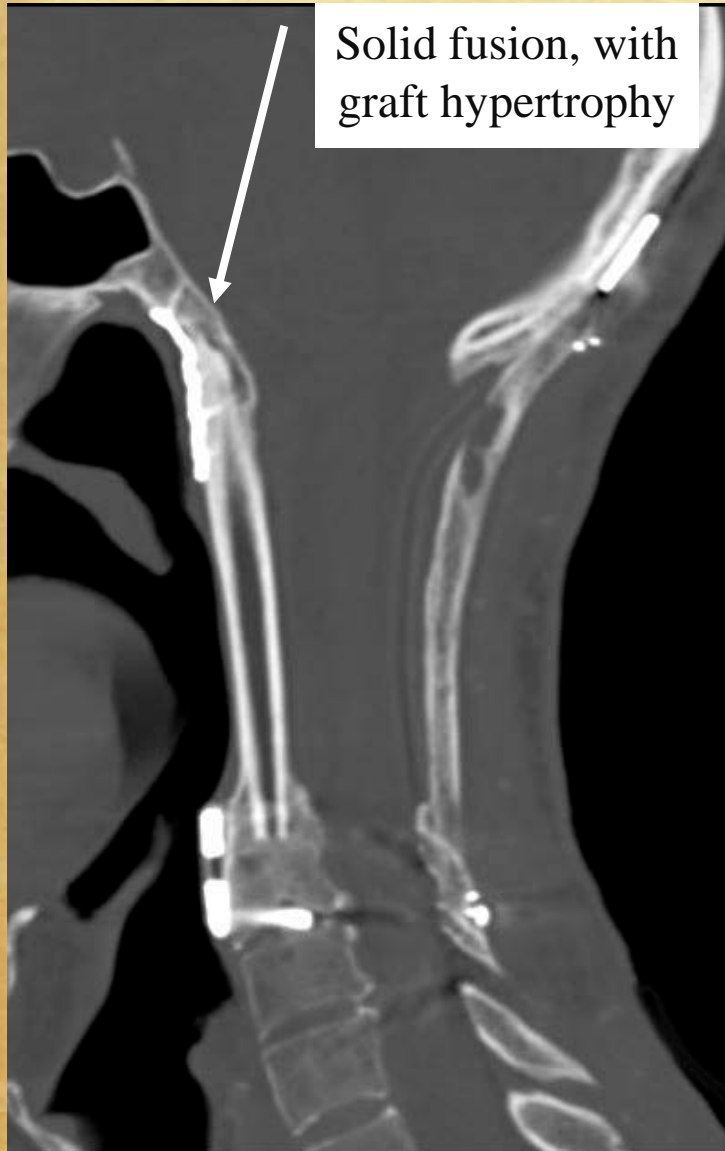
## Stage 2 – Anterior Trans-Labial Trans-Mandibular Approach







3 years – post: “head on a stick”





**THANK YOU**